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Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement--Site D (Data Supplement)

KVB, Inc.
Minneapolis, MN

Prepared for

Industrial Environmental Research Lab.
Research Triangle Park, NC

Dec 79

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Boilers	Efficiency	Stationary Sources	13A	
Combustion	Flue Gases	Combustion Modification	21B	
Coal	Fly Ash	Spreader Stokers	21D	
Field Tests	Particle Size	Particulate	14B	
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by

J.O. Burlingame, R.A. Parker, W.M. Jackson,
and J.D. Demont

KVB, Inc.
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

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Project Officers: Robert E. Hall (EPA) and William T. Harvey, Jr. (DoE)

Industrial Environmental Research Laboratory
Office of Energy, Minerals, and Industry
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Division of Power Systems/Energy Technology Branch
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and

AMERICAN BOILER MANUFACTURERS ASSOCIATION
1500 Wilson Boulevard
Arlington, VA 22209

i (b)

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The Data Supplement is a compilation of test data presented in greater detail than was practical in the Final Technical Report. It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations and conclusions. The Final Technical Report also contains data summaries not found in this volume. The Supplement contains panel board data for each test, detailed particulate, O_2, CO_2, NO, SO_2 and SO_3 data, particle size distribution data, modified smoke spot data, chemical analysis of the coal and coal size consistency data.

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FOREWORD

The purpose of this Data Supplement Volume is to document data in greater detail than was practical in the Final Technical Report.[1] It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations and conclusions. The Final Technical Report also contains data summaries not found in this volume.

The data in this volume are arranged by type (i.e., Panel Board Data, Particulate Data, etc.) and within each type by test number. Data summaries where they exist are at the front of each section. The boiler tested is referred to as Boiler D; as it is the fourth boiler tested under the program entitled, "A Testing Program to Update Equipment Specifications and Design Criteria for Stoker Fired Boilers."

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[1] Gabrielson, J. E., et al., "Field Tests of Industrial Stoker Coal-Fired Boilers for Emissions Control and Efficiency Improvement - Site D,"

CONVERSION FACTORS

ENGLISH AND METRIC UNITS TO SI UNITS

To Convert From	To	Multiply By
in	cm	2.540
in^2	cm^2	6.452
ft	m	0.3048
ft^2	m^2	0.09290
ft^3	m^3	0.02832
lb	Kg	0.4536
lb/hr	Mg/s	0.1260
$lb/10^6BTU$	ng/J	430
9/Mcal	ng/J	239
BTU	J	1054
BTU/lb	J/kg	0.002324
BTU/hr	W	0.2929
J/sec	W	1.000
J/hr	W	3600
BTU/ft/hr	W/m	0.9609
BTU/ft/hr	J/hr/m	3459
$BTU/ft^2/hr$	W/m^2	3.152
$BTU/ft^2/hr$	$J/hr/m^2$	11349
$BTU/ft^3/hr$	W/m^3	10.34
$BTU/ft^3/hr$	$J/hr/m^3$	37234
psia	Pa	6895
"H_2O	Pa	249.1
Rankine	Celsius	C = 5/9R-273
Fahrenheit	Celsius	C = 5/9(F-32)
Celsius	Kelvin	K = C+273
Rankine	Kelvin	K = 5/9R
COAL FUEL ONLY		
ppm @ 3% O_2 (SO_2)	ng/J	0.851
ppm @ 3% O_2 (SO_3)	ng/J	1.063
ppm @ 3% O_2 (NO)	ng/J	0.399
ppm @ 3% O_2 (NO_2)	ng/J	0.611
ppm @ 3% O_2 (CO)	ng/J	0.372
ppm @ 3% O_2 (CH_4)	ng/J	0.213

CONVERSION FACTORS

SI UNITS TO ENGLISH AND METRIC UNITS

To Convert From	To	Multiply By
cm	in	0.3937
cm^2	in^2	0.1550
m	ft	3.281
m^2	ft^2	10.764
m^3	ft^3	35.315
Kg	lb	2.205
Mg/s	lb/hr	7.937
ng/J	$lb/10^6 BTU$	0.00233
ng/J	g/Mcal	0.00418
J	BTU	0.000948
J/kg	BTU/lb	4.303
J/hr/m	BTU/ft/hr	0.000289
$J/hr/m^2$	$BTU/ft^2/hr$	0.0000881
$J/hr/m^3$	$BTU/ft^3/hr$	0.0000269
W	BTU/hr	3.414
W	J/hr	0.000278
W/m	BTU/ft/hr	1.041
W/m^2	$BTU/ft^2/hr$	0.317
W/m^3	$BTU/ft^3/hr$	0.0967
Pa	psia	0.000145
Pa	"H_2O	0.004014
Kelvin	Fahrenheit	F = 1.8K-460
Celsius	Fahrenheit	F = 1.8C+32
Fahrenheit	Rankine	R = F+460
Kelvin	Rankine	R = 1.8K

COAL FUEL ONLY

ng/J	ppm @ 3% O_2 (SO_2)	1.18
ng/J	ppm @ 3% O_2 (SO_3)	0.941
ng/J	ppm @ 3% O_2 (NO)	2.51
ng/J	ppm @ 3% O_2 (NO_2)	1.64
ng/J	ppm @ 3% O_2 (CO)	2.69
ng/J	ppm @ 3% O_2 (CH_4)	4.69

SI PREFIXES

Multiplication Factor	Prefix	SI Symbol
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{2}	hecto*	h
10^{1}	deka*	da
10^{-1}	deci*	d
10^{-2}	centi*	c
10^{-3}	milli	m
10^{-6}	micro	µ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

*Not recommended but occasionally used

EMISSION UNITS CONVERSION FACTORS
FOR TYPICAL COAL FUEL (HV = 13,320 BTU/LB)

To Obtain \ Multiply By		% Weight in Fuel		lbs/10^6Btu		grams/10^6Cal		PPM (Dry @ 3% O_2)		Grains/SCF. (Dry @ 12% CO_2)	
		S	N	SO_2	NO_2	SO_2	NO_2	SOx	NOx	SO_2	NO_2
% Weight In Fuel	S	1		0.666		0.370		13.2×10^{-4}		1.48	
	N				0.405		0.225		5.76×10^{-4}		.903
lbs/10^6Btu	SO_2	1.50		1		(.556)		19.8×10^{-4}		(2.23)	
	NO_2		2.47				(.556)		14.2×10^{-4}		(2.23)
grams/10^6Cal	SO_2	2.70		(1.8)		1		35.6×10^{-4}		(4.01)	
	NO_2		4.44		(1.8)				25.6×10^{-4}		(4.01)
PPM (Dry @ 3% O_2)	SOx	758		505		281		1		1127	
	NOx		1736		704		391				1566
Grains/SCF (Dry @ 12% CO_2)	SO_2	.676		(.448)		(.249)		8.87×10^{-4}		1	
	NO_2		1.11		(.448)		(.249)		6.39×10^{-4}		

NOTE:
1. Values in parenthesis can be used for all flue gas constituents such as oxides of carbon, oxides of nitrogen, oxides of sulfur, hydrocarbons, particulates, etc.
2. Standard reference temperature of 530°R was used.

KVB 15900-529

SECTION 1.0

PANEL BOARD DATA

1.1 CONTROL ROOM DATA SHEETS PAGE 2

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR ____________

COAL, LB/HR ____________

LOAD, % ____________

TEST NO.	1				
DESCRIPTION:	3/4 load				
	low OFA Normal Air				
COAL	Ohio				
TIME OF READING	14.18				
STEAM FLOW INTEGRATOR x 1000 lbs	594162				
	7/27/78				
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	0.7				
NO. 1 ZONE PRESS, "H_2O	.2-5				
NO. 2 ZONE PRESS, "H_2O	.50				
NO. 3 ZONE PRESS, "H_2O	.52				
NO. 4 ZONE PRESS, "H_2O	.60				
NO. 5 ZONE PRESS, "H_2O	17				
FURNACE DRAFT, "H_2O	-.10				
BOILER OUT DRAFT, "H_2O	-13				
ECONOMIZER OUTLET, "H_2O	-26				
DUST COLLECTOR OUT, "H_2O	8.0				
HIGH OVERFIRE AIR, "H_2O	6.0				
LOW OVERFIRE AIR, "H_2O	6.0				
BOILER DRUM LEVEL, "H_2O	0.2				

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.	1				
DRUM PRESSURE, PSIG	220				
FEEDWATER PRESSURE, PSIG	365				
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	67				
AIR FLOW, % (BLUE)	69				
FLUE GAS TEMP, °F (GREEN)	350				
STEAM PRESSURE, PSIG (PURPLE)	212				
SMOKE DENSITY, % (BLUE)	12				
CONTROLS					
MASTER	12.5/18.5				
STOKER	20.5/20.5				
F.D. DAMPER	18/18				
I.D. DAMPER	19.5/19.5				
FEEDWATER	12.0/12.0				
DRUM LEVEL	36/12				
COAL SCALE COUNTERS					
TIME OF READING					
COAL SCALE A X 200 LBS	279659				
COAL SCALE B X 200 LBS	222828				
UPPER OFA PRESSURE, "H_2O					
LOWER OFA PRESSURE, "H_2O					

Sheet 3 of 3

KVB

ABMA SITE D

NOTES

TEST NO: 1. Paper machine came on at 14:30 and test was ended. The load shot up to 80 klb/hr so they brought on another boiler causing the load to drop to 40 klbs/hr.

TEST NO:

TEST NO:

TEST NO:

TEST NO:

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 65,561
COAL, LB/HR 5407
LOAD, % 82.0

TEST NO.	2	2	2	2	
DESCRIPTION:	3/4 load,	normal O_2,	low OFA		
	7/25/78				
COAL	Ohio				
TIME OF READING	9:32	10:32	11.33	12:46	
STEAM FLOW INTEGRATOR x 1000 lbs	895243	895308	895375	895455	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	.80	.80	.90	.80	
NO. 1 ZONE PRESS, "H_2O	.30	.30	.40	.35	
NO. 2 ZONE PRESS, "H_2O	.50	.60	.65	.60	
NO. 3 ZONE PRESS, "H_2O	.50	.60	.70	.60	
NO. 4 ZONE PRESS, "H_2O	.60	.70	.70	.70	
NO. 5 ZONE PRESS, "H_2O	0	0	0	0	
FURNACE DRAFT, "H_2O	-.12	-.11	-.10	-.10	
BOILER OUT DRAFT, "H_2O	-1.2	-1.4	-1.2	-1.2	
ECONOMIZER OUTLET, "H_2O	-2.4	-2.4	-2.6	-2.6	
DUST COLLECTOR OUT, "H_2O	-8.5	-7.5	-8.0	-7.5	
HIGH OVERFIRE AIR, "H_2O	6.0	6.0	6.0	6.0	
LOW OVERFIRE AIR, "H_2O	6.0	6.0	6.0	6.0	
BOILER DRUM LEVEL, "H_2O	3	.2	.3	.1	

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.	2	2	2	2	
DRUM PRESSURE, PSIG	205	202	220	215	
FEEDWATER PRESSURE, PSIG	360	357	360	360	
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	68	68	68	67	
AIR FLOW, % (BLUE)	70	68	70	68	
FLUE GAS TEMP, °F (GREEN)	360	360	360	365	
STEAM PRESSURE, PSIG (PURPLE)	202	204	210	210	
SMOKE DENSITY, % (BLUE)	—	—	—	—	
CONTROLS					
MASTER	18/18	19.5/19	16/18.5	14/18	
STOKER	16/16	16/16	20/20	16/16	
F.D. DAMPER	17.5/17.5	17.5/17.5	18/18	18/18	
I.D. DAMPER	19.5/19.5	19.5/19.5	19.5/19.5	19.5/19.5	
FEEDWATER	12/12	12/12	12/12	12/12	
DRUM LEVEL	36/12	36/12.5	36/12	36/12.5	
COAL SCALE COUNTERS					
TIME OF READING	9:41			12:42	
COAL SCALE A X 200 LBS	279849			279935	
COAL SCALE B X 200 LBS	223064			223105	
UPPER OFA PRESSURE, "H_2O	6		6		
LOWER OFA PRESSURE, "H_2O	6.5		6.5		

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 62,379

COAL, LB/HR 5,257

LOAD, % 78.0

TEST NO.	3				
DESCRIPTION:	3/4 load, normal O_2, [redacted] 10" o.F.A.				
DATE	8-3-78				
COAL	Ohio				
TIME OF READING	17:53	18:52	20:11	21:40	
STEAM FLOW INTEGRATOR x 1000 lbs	903992	904050	904134	904228	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	.70	.80	.50		
. 1 ZONE PRESS, "H_2O	.20	.25	.15		
NO. 2 ZONE PRESS, "H_2O	.55	.60	.35		
NO. 3 ZONE PRESS, "H_2O	.55	.65	.35		
NO. 4 ZONE PRESS, "H_2O	.55	.67	.45		
NO. 5 ZONE PRESS, "H_2O	.05	.17	.05		
FURNACE DRAFT, "H_2O	-.09	-.07	-.09		
BOILER OUT DRAFT, "H_2O	-1.45	-1.45	-1.10		
ECONOMIZER OUTLET, "H_2O	-3.1	-3.1	-2.4		
DUST COLLECTOR OUT, "H_2O	-9.5	-9.5	-7.0		
HIGH OVERFIRE AIR, "H_2O	10.0	10.0	10.0		
LOW OVERFIRE AIR, "H_2O	9.5	9.5	9.5		
OILER DRUM LEVEL, "H_2O	.3	.2	.2		

s - of 3 ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	210	210	205		
FEEDWATER PRESSURE, PSIG	355	358	360		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	66 60	68 70	58		
AIR FLOW, % (BLUE)	70 60	72	58		
FLUE GAS TEMP, °F (GREEN)	370	370	360		
STEAM PRESSURE, PSIG (PURPLE)	207	208	205		
SMOKE DENSITY, % (BLUE)	—	—	—		
CONTROLS Loading/control					
MASTER	16/18.5	17.0/19.0	17.0/18.0		
STOKER	19/19.0	19.0/19.5	18.0/18.0		
F.D. DAMPER	18.0/18.0	18.5/18.5	17.5/18.0		
I.D. DAMPER	22.0/21.5	29.0/28.5	16.0/16.0		
FEEDWATER	12.0/12.0	12.5/12.5	10.0/10.0		
DRUM LEVEL	36.0/13.0	36.0/12.0	36.0/12.5		
COAL SCALE COUNTERS	18:02			21:32	
TIME OF READING					
COAL SCALE A X 200 LBS	281711			281753	
COAL SCALE B X 200 LBS	224991			225041	
UPPER OFA PRESSURE, "H_2O		9.5			
LOWER OFA PRESSURE, "H_2O		10.0			

Sheet 3 of 3

KVB

ABMA SITE D

NOTES

TEST NO: 3. All controls on automatic. Coal was wet this morning, but much drier now. Bottom Ash emptied just before test. Soot was blown at 20:45 and testing at the boiler out was ruined. Testing at the stack was stopped until soot was done being blown

TEST NO:

TEST NO:

TEST NO:

TEST NO:

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 57,400 lbs/hr
COAL, LB/HR 4022 lbs/hr
LOAD, % 71.7%

TEST NO.	4				
DESCRIPTION:	3/4 load				attempt
	10" O.F.A				to change
COAL	OHIO	OHIO			air
TIME OF READING	10:14	11:22	12:40	13:16	
STEAM FLOW INTEGRATOR x 1000 lbs	920046	920111	920181	920220	
	8-15-78				
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	.3	.4	.5		1.0
NO. 1 ZONE PRESS, "H_2O	0	.2	.2		.5
NO. 2 ZONE PRESS, "H_2O	.2	.4	.4		.7
NO. 3 ZONE PRESS, "H_2O	.2	.4	.4		.7
NO. 4 ZONE PRESS, "H_2O	.2	.4	.4		.7
NO. 5 ZONE PRESS, "H_2O	0	.1	.1		.4
FURNACE DRAFT, "H_2O	-.10	-.16	-.16		0
BOILER OUT DRAFT, "H_2O	-.90	-1.1	-1.1		-.9
ECONOMIZER OUTLET, "H_2O	-2.0	-2.2	-2.2		-2.0
DUST COLLECTOR OUT, "H_2O	-1.0	-.75	-.75		-.70
HIGH OVERFIRE AIR, "H_2O	10.0	10.0	10.0		10.0
LOW OVERFIRE AIR, "H_2O	10.0	10.0	10.0		10.0
BOILER DRUM LEVEL, "H_2O	0	0	0		

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	207	210	205		
FEEDWATER PRESSURE, PSIG	365	360	360		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	58	60	58		60
AIR FLOW, % (BLUE)	59	58	58		68
FLUE GAS TEMP, °F (GREEN)	360	360	362		
STEAM PRESSURE, PSIG (PURPLE)	209	207	205		
SMOKE DENSITY, % (BLUE)	30	30	30		
CONTROLS Load/control					
MASTER hand	15.5/16.0	16.5/15.5	16.0/15.5		
STOKER hand	14.5/13.0	13.0/13.0	14.0/14.0		
F.D. DAMPER hand	16.0/16.5	16.0/16.5	12.0/17.0		
I.D. DAMPER hand	15.0/14.0	15.0/14.0	15.0/13.5		
FEEDWATER auto	12.0/12.0	12.5/12.5	11.5/11.5		
DRUM LEVEL	36.0/14.0	36.0/14.0	36/13.5		
COAL SCALE COUNTERS	10:31		13:06		
TIME OF READING	285084		285114		
COAL SCALE A X 200 LBS	228515		228546		
COAL SCALE B X 200 LBS					
UPPER OFA PRESSURE, "H_2O	10.0				
LOWER OFA PRESSURE, "H_2O	10.5				

Sheet 3 of 3

KVB

ABMA SITE D

NOTES

TEST NO: Test #4 - All controls, but feedwater were placed
on hand
after part. test. completed an attempt was made
to try and change the air. By adjusting the F.D.
and stoker controls the air pen leveled off at 68%

TEST NO: and 0" furnace draft the load bounced between
58 and 61 K lb/hr. O_2 in the stack varied
between 8.7 and 10% CO and NO remained
constant

TEST NO:

TEST NO:

TEST NO:

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 76,986
COAL, LB/HR 6629
LOAD, % 96.2

TEST NO.	5				
DESCRIPTION:	Full load	normal O_2	10" OFA		
COAL	Ohio				
TIME OF READING	12:45	14:00	15:15	16:24	
STEAM FLOW INTEGRATOR x 1000 lbs	921322	921418	921517	921603	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	1.4	1.3	1.2		
. 1 ZONE PRESS, "H_2O	.7	.6	.5		
NO. 2 ZONE PRESS, "H_2O	1.1	.9	.8		
NO. 3 ZONE PRESS, "H_2O	1.1	1.0	.8		
NO. 4 ZONE PRESS, "H_2O	1.2	1.0	.9		
NO. 5 ZONE PRESS, "H_2O	.5	.3	.4		
FURNACE DRAFT, "H_2O	-.2	+.1	-.1		
BOILER OUT DRAFT, "H_2O	-1.5	-1.4	-1.4		
ECONOMIZER OUTLET, "H_2O	-3.2	-3.1	-3.1		
DUST COLLECTOR OUT, "H_2O	-9.5	-9.0	-9.0		
HIGH OVERFIRE AIR, "H_2O	10.0	10.0	10.0		
LOW OVERFIRE AIR, "H_2O	10.0	10.0	10.0		
ILER DRUM LEVEL, "H_2O	+.2	+.2	+.2		

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	210	213	212		
FEEDWATER PRESSURE, PSIG	352	362	360		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	80	80	82		
AIR FLOW, % (BLUE)	78	78	80		
FLUE GAS TEMP, °F (GREEN)	375	380	390		
STEAM PRESSURE, PSIG (PURPLE)	200	200	200		
SMOKE DENSITY, % (BLUE)	30	20	18		
CONTROLS					
MASTER	19.0/20.0	19.0/20.6	14.0/15.5		
STOKER	15.0/16.0	15.5/16.5	14.0/15.5		
F.D. DAMPER	19.5/19.0	19.0/15.5	19.0/14.0		
I.D. DAMPER scale goes to 30"	31.0/30.5	33/32	33/33		
FEEDWATER	14.0/14.0	14.0/14.0	14.0/14.0		
DRUM LEVEL	36.0/18.0	36/18.5	32.0/18.0		
COAL SCALE COUNTERS					
TIME OF READING	12:58			16:28	
COAL SCALE A X 200 LBS	285352			285411	
COAL SCALE B X 200 LBS	228790			228847	
UPPER OFA PRESSURE, "H_2O	9.5				
LOWER OFA PRESSURE, "H_2O	10.5				

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 58,644
COAL, LB/HR [redacted] 4850
LOAD, % 73.3%

TEST NO.	6				
DESCRIPTION:	3/4 load, normal O_2, 5.0" O.F.A.				
COAL	Ohio				
TIME OF READING	8:56	9:53	10.53	11:58	1258
STEAM FLOW INTEGRATOR x 1000 lbs	923365	923425	923486	923544	923596
				on load	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	.70	.60	.60	.60	
1 ZONE PRESS, "H_2O	.25	.30	.30	.40	
NO. 2 ZONE PRESS, "H_2O	.50	.40	.50	.45	
NO. 3 ZONE PRESS, "H_2O	.50	.40	.45	.45	
NO. 4 ZONE PRESS, "H_2O	.55	.60	.50	.50	
NO. 5 ZONE PRESS, "H_2O	.05	.0	.20	.80	
FURNACE DRAFT, "H_2O	-.10	-.10	-.10	-.10	
BOILER OUT DRAFT, "H_2O	-1.1	-1.0	-1.0	-1.0	
ECONOMIZER OUTLET, "H_2O	-2.2	-2.0	-2.1	-2.1	
DUST COLLECTOR OUT, "H_2O	-1.5	-6.0	-6.0	-6.0	
HIGH OVERFIRE AIR, "H_2O	5.0	5.0	5.0	5.0	
LOW OVERFIRE AIR, "H_2O	5.0	5.0	5.0	5.0	
ILER DRUM LEVEL, "H_2O	-.1	-.2	-.2	-.2	

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	210	210	206	205	
FEEDWATER PRESSURE, PSIG	360	360	362	359	
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	63	60	62	60	
AIR FLOW, % (BLUE)	61	58	60	58	
FLUE GAS TEMP, °F (GREEN)	360	360	363	363	
STEAM PRESSURE, PSIG (PURPLE)	205	205	204	202	
SMOKE DENSITY, % (BLUE)	13	13	13	8	
CONTROLS					
MASTER	17.0/17.5	17.0/17.5	17.0/17.5	18.0/18.0	
STOKER	14.0/14.5	14.0/14.5	14.5/15.0	[illegible]3.0/14.5	
F.D. DAMPER	17.0/17.0	17.0/17.0	17.0/17.0	17.5/17.5	
I.D. DAMPER	14.0/14.0	12.5/12.5	13.0/13.0	12.5/13.0	
FEEDWATER	12.0/12.0	12.5/13.0	13.0/13.0	11.5/11.5	
DRUM LEVEL	36.0/13.0	36.0/13.0	36.0/14.0		
COAL SCALE COUNTERS					
TIME OF READING	9:00		11:19	12:07	12 57
COAL SCALE A X 200 LBS	285801		831	839	848
COAL SCALE B X 200 LBS	229223		252	260	270
UPPER OFA PRESSURE, "H_2O	5.0			5.0	
LOWER OFA PRESSURE, "H_2O	5.5			5.0	

Sheet 3 of 3

KVB

ABMA SITE D

NOTES

TEST NO: 6 At the start of testing Boiler #3 was down due to faulty I.D. Fan, paper machine also came down so test was run at 60Klbs instead of 80Klbs. At 11:45 I.D. fan was fixed and paper machine was brought up. Testing was stopped untill 12:00.

TEST NO:

TEST NO:

TEST NO:

TEST NO:

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 57,000

COAL, LB/HR 4863

LOAD, % 71.3%

TEST NO.	7	7	7	7	
DESCRIPTION:	3/4 load,	normal O_2,	High O.F.A.		
	8-22-78				
COAL	Ohio Coal				
TIME OF READING	17:24	18:24	19:28	20:30	20:44
STEAM FLOW INTEGRATOR x 1000 lbs	928293	928351	928412	928469	928483
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	0.60	0.70	0.70	0.70	
. 1 ZONE PRESS, "H_2O	0.25	0.25	0.25	0.30	
NO. 2 ZONE PRESS, "H_2O	0.50	0.50	0.60	0.50	
NO. 3 ZONE PRESS, "H_2O	0.50	0.50	0.50	0.55	
NO. 4 ZONE PRESS, "H_2O	0.50	0.55	0.55	0.60	
NO. 5 ZONE PRESS, "H_2O	0.10	0.20	0.15	0.15	
FURNACE DRAFT, "H_2O	-0.10	-.09	-.10	-.10	
BOILER OUT DRAFT, "H_2O	-1.15	-1.15	-1.20	-1.25	
ECONOMIZER OUTLET, "H_2O	-2.20	-2.4	-2.50	-2.6	
DUST COLLECTOR OUT, "H_2O	-7.0	-7.5	-7.5	-7.5	
HIGH OVERFIRE AIR, "H_2O	15.0	15.0	15.0	15.0	
LOW OVERFIRE AIR, "H_2O	13.5	13.5	13.5	13.5	
ILER DRUM LEVEL, "H_2O	-.2	-.2	-.1	-.1	

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	204	203	205	210	
FEEDWATER PRESSURE, PSIG	358	359	360	360	
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	60	59	60	62	
AIR FLOW, % (BLUE)	60	60	60	60	
FLUE GAS TEMP, °F (GREEN)	370	370	375	380	
STEAM PRESSURE, PSIG (PURPLE)	203	203	205	207	
SMOKE DENSITY, % (BLUE)	12	12	12	12	
CONTROLS					
MASTER	20.0/19.0	20.0/19.0	19.0/19.0	18.5/19.0	
STOKER	17.0/16.0	18.5/18.0	16.0/15.5	15.0/14.5	
F.D. DAMPER	19.0/17.0	18.5/17.5	18.5/17.5	17.5/18.5	
I.D. DAMPER	20.0/20.0	17.5/17.5	19.0/19.0	20.0/21.5	
FEEDWATER	12.5/12.5	12.0/12.0	12.0/13.0	12.0/12.5	
DRUM LEVEL	36.0/14.0	36.0/14.0	36.0/13.5	35.0/13.5	
COAL SCALE COUNTERS	17:30			20.40	
TIME OF READING	281645			286005	
COAL SCALE A X 200 LBS	236273			230770	
COAL SCALE B X 200 LBS					
UPPER OFA PRESSURE, "H_2O	15.5		15.5		
LOWER OFA PRESSURE, "H_2O	15.5		15.5		

Sheet 3 of 3

KVB

ABMA SITE D

NOTES

TEST NO: 7 Fireman seems to think that the grate ash [illegible] is more burned up than when run at 10" O.F.A.

Paper broke on machine about 19:50, load

TEST NO: dropped to 50K lbs testing was stopped until 20:10

TEST NO:

TEST NO:

TEST NO:

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 59,016

COAL, LB/HR 4282

LOAD, % ~~[illegible]~~ 73.8%

TEST NO.	8				
DESCRIPTION:	3/4 load,	high O_2,	norm OFA		
	8-23-78				
COAL	Ohio Coal				
TIME OF READING	11:29	12:31	13:44	14:32	
STEAM FLOW INTEGRATOR x 1000 lbs	929165	929225	929298	929345	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	0.80	0.70	1.0		
NO. 1 ZONE PRESS, "H_2O	0.30	0.30	0.40		
NO. 2 ZONE PRESS, "H_2O	0.55	0.55	0.70		
NO. 3 ZONE PRESS, "H_2O	0.55	0.55	0.70		
NO. 4 ZONE PRESS, "H_2O	0.60	0.70	0.70		
NO. 5 ZONE PRESS, "H_2O	0.10	0.05	0.10		
FURNACE DRAFT, "H_2O	-0.10	-0.10	-0.10		
BOILER OUT DRAFT, "H_2O	-1.15	-1.20	-1.40		
ECONOMIZER OUTLET, "H_2O	-2.60	-2.60	-3.00		
DUST COLLECTOR OUT, "H_2O	-7.5	-7.7	-9.0		
HIGH OVERFIRE AIR, "H_2O	10.0	10.0	10.0		
LOW OVERFIRE AIR, "H_2O	10.0	10.0	10.0		
BOILER DRUM LEVEL, "H_2O	-.2	-.2	-.2		

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	220	220	220		
FEEDWATER PRESSURE, PSIG	366	365	365		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	60	58	66		
AIR FLOW, % (BLUE)	66	66	75		
FLUE GAS TEMP, °F (GREEN)	370	372	380		
STEAM PRESSURE, PSIG (PURPLE)	218	218	215		
SMOKE DENSITY, % (BLUE)	12	11	14		
CONTROLS					
MASTER	13.0/18.5	13.0/19.0	14.5/19.5		
STOKER	22.5/15.5	24.0/16.0	26.0/17.0		
F.D. DAMPER	18.0/18.0	18.5/18.5	19.0/19.0		
I.D. DAMPER	8.5/19.0	5.0/20.0	6.0/21.0		
FEEDWATER	12.0/12.0	12.0/12.0	12.0/12.0		
DRUM LEVEL	36.0/14.0	36.0/14.0	36.0/18.5		
COAL SCALE COUNTERS					
TIME OF READING	11:36			14:33	
COAL SCALE A X 200 LBS	287040			287079	
COAL SCALE B X 200 LBS	231454			236491	
UPPER OFA PRESSURE, "H_2O	10.0		10.0		
LOWER OFA PRESSURE, "H_2O	9.5		9.5		

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 40,091
COAL, LB/HR 2725
LOAD, % 50.1%

TEST NO.	9				
DESCRIPTION:	40 klbs/hr	normal O_2	and OFA		
	8/24/78				
COAL	Ohio				
TIME OF READING	15:22	16:22	17:30	19:02	
STEAM FLOW INTEGRATOR x 1000 lbs	935942	935981	936027	936089	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	0.4	0.3	0.3	0.3	
NO. 1 ZONE PRESS, "H_2O	0.1	0.05	0.05	0.05	
NO. 2 ZONE PRESS, "H_2O	0.35	0.25	0.30	0.30	
NO. 3 ZONE PRESS, "H_2O	0.30	0.20	0.25	0.30	
NO. 4 ZONE PRESS, "H_2O	0.35	0.25	0.30	0.30	
NO. 5 ZONE PRESS, "H_2O	0.05	0.05	0.05	0.05	
FURNACE DRAFT, "H_2O	-0.10	-0.11	-0.11	-0.11	
BOILER OUT DRAFT, "H_2O	-.85	-.80	-.80	-.80	
ECONOMIZER OUTLET, "H_2O	-1.7	-1.6	-1.6	-1.6	
DUST COLLECTOR OUT, "H_2O	-5.0	-4.5	-4.5	-4.5	
HIGH OVERFIRE AIR, "H_2O	10.0	10.0	10.0	10.0	
LOW OVERFIRE AIR, "H_2O	10.0	10.0	9.5	9.5	
BOILER DRUM LEVEL, "H_2O	-.3	-.5	-.5	-.4	

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	200	197	199	198	
FEEDWATER PRESSURE, PSIG	355	350	355	355	
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	42	42	41	42	
AIR FLOW, % (BLUE)	40	40	40	40	
FLUE GAS TEMP, °F (GREEN)	340	340	342	344	
STEAM PRESSURE, PSIG (PURPLE)	200	200	202	201	
SMOKE DENSITY, % (BLUE)	7	7	7	7	
CONTROLS					
MASTER	14.5/16.5	15.0/16.0	14.0/16.5	15.0/16.5	
STOKER	13.0/13.0	11.0/11.0	13.0/13.0	12.0/12.0	
F.D. DAMPER	16.0/16.0	16.0/16.0	16.0/16.0	16.0/16.0	
I.D. DAMPER	9.0/9.0	8.0/7.5	8.0/7.5	8.0/7.5	
FEEDWATER	10.0/10.0	10.0/10.0	10.0/10.0	10.0/10.0	
DRUM LEVEL	36.0/14.5	36.0/15.0	36.0/15.0	36.0/14.5	
COAL SCALE COUNTERS	15:26		18:53		
TIME OF READING					
COAL SCALE A X 200 LBS	288345		288410		
COAL SCALE B X 200 LBS	231925		231960		
UPPER OFA PRESSURE, "H_2O	9.5	9.5			
LOWER OFA PRESSURE, "H_2O	10.0	10.0			

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 56,847
COAL, LB/HR 4800
LOAD, % 71

TEST NO.	10				
DESCRIPTION:	60 klb/hr.				
	8/30/78				
COAL	Ohio				
TIME OF READING	16:44	17 30	18:48	19:38	
STEAM FLOW INTEGRATOR x 1000 lbs	937005	937070	937134	937170	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	0.60	0.60	0.60		
NO. 1 ZONE PRESS, "H_2O	0.15	0.20	0.20		
NO. 2 ZONE PRESS, "H_2O	0.40	0.50	0.50		
NO. 3 ZONE PRESS, "H_2O	0.40	0.45	0.45		
NO. 4 ZONE PRESS, "H_2O	0.45	0.50	0.50		
NO. 5 ZONE PRESS, "H_2O	0	0	0		
FURNACE DRAFT, "H_2O	-0.10	-0.10	-0.10		
BOILER OUT DRAFT, "H_2O	-1.10	-1.10	-1.10		
ECONOMIZER OUTLET, "H_2O	-2.4	-2.3	-2.4		
DUST COLLECTOR OUT, "H_2O	-6.5	-6.5	-6.5		
HIGH OVERFIRE AIR, "H_2O	10.0	10.0	10.0		
LOW OVERFIRE AIR, "H_2O	10.0	10.0	10.0		
BOILER DRUM LEVEL, "H_2O	-.20	-.20	-.20		

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	210	210	210		
FEEDWATER PRESSURE, PSIG	363	360	362		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	60	60	60		
AIR FLOW, % (BLUE)	55	55	55		
FLUE GAS TEMP, °F (GREEN)	370	370	370		
STEAM PRESSURE, PSIG (PURPLE)	210	210	210		
SMOKE DENSITY, % (BLUE)	12	12	12		
CONTROLS					
MASTER	12.0/17.5	12.5/17.5	12.0/17.0		
STOKER	14.0/17.0	13.5/17.0	14.0/17.0		
F.D. DAMPER	17.0/17.0	17.0/17.0	17.0/17.5		
I.D. DAMPER	15.0/15.0	15.0/15.0	15.0/15.0		
FEEDWATER	12.0/12.0	12.0/12.0	12.0/12.0		
DRUM LEVEL	36.0/14.0	36.0/14.0	36.0/14.0		
COAL SCALE COUNTERS					
TIME OF READING	1210		14:30		
COAL SCALE A X 200 LBS	[illegible]		611		
COAL SCALE B X 200 LBS	186		[illegible]		
UPPER OFA PRESSURE, "H_2O		[illegible]			
LOWER OFA PRESSURE, "H_2O		[illegible]			

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 46857
COAL, LB/HR 3892
LOAD, % 58.6

8-31-78

TEST NO. 11	10"	5"	15"	10"	5"	
DESCRIPTION: ^{15}Hi, ^{10}med ^{5}Low OfA						
Varry Both High+Low^{Jets}						
COAL						
TIME OF READING	4:25	4:45	510	530	550	610
STEAM FLOW INTEGRATOR x 1000 lbs	938102	938120	938138	938156	938170	938184
DRAFT GAUGES						
F.D. FAN PRESS, "H_2O	.4	.42	4.2	.42	.42	.42
NO. 1 ZONE PRESS, "H_2O	.1	.12	.15	.13	.12	.13
NO. 2 ZONE PRESS, "H_2O	.35	.35	.35	.35	.35	.35
NO. 3 ZONE PRESS, "H_2O	.3	.35	.35	.35	.37	.35
NO. 4 ZONE PRESS, "H_2O	.35	.4	.38	.38	.38	.35
NO. 5 ZONE PRESS, "H_2O	.09	.1	.1	.1	.1	.1
FURNACE DRAFT, "H_2O	.1	.11	.1	.11	.13	.11
BOILER OUT DRAFT, "H_2O	-1.0	-.85	1.0	.98	.89	1.0
ECONOMIZER OUTLET, "H_2O	-2.0	-1.9	2.2	2.0	1.95	2.2
DUST COLLECTOR OUT, "H_2O	-6.2	-5.1	6.8	6.3	5.5	7.0
HIGH OVERFIRE AIR, "H_2O	10+	5+	15+	10.5	5	15.0
LOW OVERFIRE AIR, "H_2O	10-	5+	14+	10.	5	14.0
ILER DRUM LEVEL, "H_2O	-.2	-.2	-.8	.5	-.3	.5

Sheet 2 of 3 ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	205	200	200	200	205 195
FEEDWATER PRESSURE, PSIG	360	365	350	360	360 350
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	50K	52K	47K	50K	50K 47K
AIR FLOW, % (BLUE)	48	48	48	48	48 48
FLUE GAS TEMP, °F (GREEN)	360	355	355	355	350 360
STEAM PRESSURE, PSIG (PURPLE)	720	710	710	710	720 690
SMOKE DENSITY, % (BLUE)	10=55%	10 55%	10 55%	10 55%	10 55% 55%
CONTROLS					
MASTER	17.5	17.5	17.5	17.5	17.5 17.5
STOKER	14.0	13.6	13.8	13.8	13.8 13.8
F.D. DAMPER	17.0	16.9	16.9	16.9	16.9 16.9
I.D. DAMPER	12.0	11.2	12.2	11.6	13.4 12.2
FEEDWATER	10.9	11.5	10.8	11.8	11.1 11.4
DRUM LEVEL	-.2				End
					626 A 829 B 457
COAL SCALE COUNTERS		A 812 B 440	A 816 B 444	A 821 B 449	A 823 A 826 B 452 B 456
TIME OF READING	~~2~~ 425	435	457	525	543 600
COAL SCALE A X 200 LBS	288810 ~~232431~~				
COAL SCALE B X 200 LBS	232437				
UPPER OFA PRESSURE, "H_2O	10	5+	15+	10.5	5 15
LOWER OFA PRESSURE, "H_2O	10	5+	14-	10.0	5 14

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 78634
COAL, LB/HR 6375
LOAD, % 983

TEST NO.	12				
DESCRIPTION:	80 Klbs/hr	high O_2			
	9/6/78				
COAL	Ohio				
TIME OF READING	10:44	11.45	12:38	13.45	14 27
STEAM FLOW INTEGRATOR x 1000 lbs	942256	942311	942380	942455	942522
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	1.4	1.2	1.20	1.2	
NO. 1 ZONE PRESS, "H_2O	.55	.50	.45	.45	
NO. 2 ZONE PRESS, "H_2O	1.10	.95	.90	.90	
NO. 3 ZONE PRESS, "H_2O	1.10	.90	.90	.90	
NO. 4 ZONE PRESS, "H_2O	1.10	.95	.97	.95	
NO. 5 ZONE PRESS, "H_2O	15	0	0	+.15	
FURNACE DRAFT, "H_2O	0	-.04	-.04	-.02	
BOILER OUT DRAFT, "H_2O		-1.5	-1.4	-1.4	
ECONOMIZER OUTLET, "H_2O		-3.0	-3.0	-3.0	
DUST COLLECTOR OUT, "H_2O		-9.5	-9.7	-9.5	
HIGH OVERFIRE AIR, "H_2O		10.0	10.0	10.0	
LOW OVERFIRE AIR, "H_2O		9.7	9.5	9.5	
BOILER DRUM LEVEL, "H_2O		+.4	+5	+3	

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.	12				
DRUM PRESSURE, PSIG	213	213	212		
FEEDWATER PRESSURE, PSIG	370	368	36		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	80	76	80		
AIR FLOW, % (BLUE)	82	78	80		
FLUE GAS TEMP, °F (GREEN)	380	382	380		
STEAM PRESSURE, PSIG (PURPLE)	205	205	205		
SMOKE DENSITY, % (BLUE)	20	20	18		
CONTROLS					
MASTER	15.0/19.0	14.0/19.0	15.0/19.5		
STOKER	15.0/15.5	20.0/21.0	16.5/18.0		
F.D. DAMPER	14.0/19.0	19.0/19.0	19.5/19.5		
I.D. DAMPER Scale goes to 30	35/33	35/33	35/33		
FEEDWATER	14.0/14.0	13.0/13.0	14.0/14.0		
DRUM LEVEL	36.0/12.5	56.0/11.0	36.0/12.5		
COAL SCALE COUNTERS					
TIME OF READING	11.46		14:26		
COAL SCALE A X 200 LBS	289677		289716		
COAL SCALE B X 200 LBS	233394		233440		
UPPER OFA PRESSURE, "H_2O		10.0			
LOWER OFA PRESSURE, "H_2O		10.0			

Sheet 3 of 3

KVB

ABMA SITE D

NOTES

TEST NO: 12 - safties blew right after testing was started, 2 got stuck and load dropped to 30 klbs/hr
- restarted test at 11:45
- couldn't get O_2 lower than last test (79%) so run at higher O_2

TEST NO:
- safties blew after drum pressure got above 230
- boiler on automatic to keep drum pressure down
- load dropped at 12:40 for 10 minutes

TEST NO:

TEST NO:

TEST NO:

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 80,331
COAL, LB/HR 6788
LOAD, % 100.4

TEST NO.	13				
DESCRIPTION:	80 klbs/hr.				
COAL	Ohio				
TIME OF READING	10:33	11:25	12:31	12:54	
STEAM FLOW INTEGRATOR x 1000 lbs	943486	943554	943635	943648	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	1.0	1.1	1.0		
NO. 1 ZONE PRESS, "H_2O	0.40	.45	0.35		
NO. 2 ZONE PRESS, "H_2O	0.80	0.90	0.75		
NO. 3 ZONE PRESS, "H_2O	0.80	0.90	0.75		
NO. 4 ZONE PRESS, "H_2O	0.75	0.75	0.70		
NO. 5 ZONE PRESS, "H_2O	0.45	0.45	0.30		
FURNACE DRAFT, "H_2O	-0.05	-.02	-.05		
BOILER OUT DRAFT, "H_2O	-1.40	-1.40	-1.35		
ECONOMIZER OUTLET, "H_2O	-3.0	-3.0	-2.9		
DUST COLLECTOR OUT, "H_2O	-9.0	-9.5	-8.7		
HIGH OVERFIRE AIR, "H_2O	5.0	7.0	7.0		
LOW OVERFIRE AIR, "H_2O	5.0	7.0	7.0		
BOILER DRUM LEVEL, "H_2O	+5	+2	+2		

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.	13				
DRUM PRESSURE, PSIG	212	214	213		
FEEDWATER PRESSURE, PSIG	350	355	354		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	80	80	79		
AIR FLOW, % (BLUE)	80	82	79		
FLUE GAS TEMP, °F (GREEN)	380	380	390		
STEAM PRESSURE, PSIG (PURPLE)	204	205	205		
SMOKE DENSITY, % (BLUE)	40	24	22		
CONTROLS					
MASTER	15.0/20.0	15.0/19.5	15.0/19.0		
STOKER	20.0/20.0	19.5/19.5	15.5/15.5		
F.D. DAMPER	19.5/19.5	19.5/19.5	19.0/19.0		
I.D. DAMPER	21.5/21.5	35/33	20.0/20.0		
FEEDWATER	13.0/13.0	14.0/14.0	14.5/14.5		
DRUM LEVEL	36.0/11.5	36.0/12.5	36.0/12.5		
COAL SCALE COUNTERS					
TIME OF READING	10:55		17:34		
COAL SCALE A X 200 LBS	284921		284948		
COAL SCALE B X 200 LBS	233663		233692		
UPPER OFA PRESSURE, "H_2O		7.0			
LOWER OFA PRESSURE, "H_2O		7.0			

Sheet 3 of 3

KVB

ABMA SITE D

NOTES

TEST NO: OFA Moved to 7" at 1105 due to very black smoke. Opacity was as high as 60% at 5" OFA when moved to 7" & fell to 20%

TEST NO:

TEST NO:

TEST NO:

TEST NO:

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 78,082

COAL, LB/HR 6318

LOAD, % 97%

TEST NO.	14				
DESCRIPTION:	7" OFA	max load			
	9/11/78				
COAL	Century				
TIME OF READING	11:33	12:36	13:32	13 54	
STEAM FLOW INTEGRATOR x 1000 lbs	947856	947938	948010	948046	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	1.0	1.0	1.0		
NO. 1 ZONE PRESS, "H_2O	.50	.50	.50		
NO. 2 ZONE PRESS, "H_2O	.80	.80	.75		
NO. 3 ZONE PRESS, "H_2O	.80	.80	.80		
NO. 4 ZONE PRESS, "H_2O	.90	.85	.80		
NO. 5 ZONE PRESS, "H_2O	.45	.45	.40		
FURNACE DRAFT, "H_2O	-.03	-.05	-.04		
BOILER OUT DRAFT, "H_2O	-1.3	-1.3	-1.3		
ECONOMIZER OUTLET, "H_2O	-2.9	-2.9	-2.8		
DUST COLLECTOR OUT, "H_2O	-9.0	-9.0	-8.5		
HIGH OVERFIRE AIR, "H_2O	7.0	7.0	7.0		
LOW OVERFIRE AIR, "H_2O	7.0	7.0	7.0		
BOILER DRUM LEVEL, "H_2O	0	0	0		

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	216	216	216		
FEEDWATER PRESSURE, PSIG	324	331	330		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	80	80	80		
AIR FLOW, % (BLUE)	80	80	80		
FLUE GAS TEMP, °F (GREEN)	380	387	390		
STEAM PRESSURE, PSIG (PURPLE)	207	207	205		
SMOKE DENSITY, % (BLUE)	40 ± 10	35 ± 5	30 ± 5		
CONTROLS					
MASTER	14.5/20.0	14.0/19.5	14.5/19.5		
STOKER	19.0/19.5	17.0/17.5	18.0/18.5		
F.D. DAMPER	20.0/20.0	19.0/19.0	19.5/19.5		
I.D. DAMPER	21.0/21.0	20.0/20.0	20.0/21.0		
FEEDWATER	13.0/15.0	14.5/14.5	15.0/15.0		
DRUM LEVEL	36.0/3.0	36.0/13.0	36.0/13.2		
COAL SCALE COUNTERS	11:35			14:01	
TIME OF READING					
COAL SCALE A X 200 LBS	240824			367	
COAL SCALE B X 200 LBS	234640			678	
UPPER OFA PRESSURE, "H_2O		2.0			
LOWER OFA PRESSURE, "H_2O		2.0			

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 79,263
COAL, LB/HR 6567
LOAD, % 99.1

TEST NO.	15				
DESCRIPTION:	80 klbs/hr Load, High O.F.A.				
	9/12/78				
COAL	Century				
TIME OF READING	11 40	12:40	1:47	2:24	2 50
STEAM FLOW INTEGRATOR x 1000 lbs	949029	949106	949193	949245	949230
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	1.3	1.2	1.2	0.9	
NO. 1 ZONE PRESS, "H_2O	.55	55	55	.50	
NO. 2 ZONE PRESS, "H_2O	.95	.95	90	.85	
NO. 3 ZONE PRESS, "H_2O	1.00	1.00	.90	.90	
NO. 4 ZONE PRESS, "H_2O	1.05	1.00	.90	.85	
NO. 5 ZONE PRESS, "H_2O	.60	55	.50	.40	
FURNACE DRAFT, "H_2O	+.04	+.06	+.02	0	
BOILER OUT DRAFT, "H_2O	-1.35	-1.32	-1.32	-1.40	
ECONOMIZER OUTLET, "H_2O	-3.1	-3.1	-3.1	-3.2	
DUST COLLECTOR OUT, "H_2O	-9.5	-10.0	-10.0	-10.0	
HIGH OVERFIRE AIR, "H_2O	15.0	15.0	15.0	15.0	
LOW OVERFIRE AIR, "H_2O	14.0	14.0	14.0	14.0	
BOILER DRUM LEVEL, "H_2O	-.1	0	0	0	

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.	15				
DRUM PRESSURE, PSIG	215	218	215		
FEEDWATER PRESSURE, PSIG	328	323	325		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	81	80	80		
AIR FLOW, % (BLUE)	80	80	80		
FLUE GAS TEMP, °F (GREEN)	372	375	375		
STEAM PRESSURE, PSIG (PURPLE)	203	207	205		
SMOKE DENSITY, % (BLUE)	20	20	16		
CONTROLS					
MASTER	15.5/20.0	14.0/19.0	15.0/14.0		
STOKER	16.0/16.0	15.0/15.0	16.5/16.5		
F.D. DAMPER	19.0/19.0	18.0/18.0	19.0/19.0		
I.D. DAMPER	34/35	34/33	34/33		
FEEDWATER	14.5/15.3	15.0/15.0	15.0/15.0		
DRUM LEVEL	36.0/33.0	36.0/13.0	36.0/35		
COAL SCALE COUNTERS					
TIME OF READING	11:46			14:50	
COAL SCALE A X 200 LBS	1070			1117	
COAL SCALE B X 200 LBS	557			734	
UPPER OFA PRESSURE, "H_2O	5.0				
LOWER OFA PRESSURE, "H_2O	16.0				

Sheet 3 of 3

KVB

ABMA SITE D

NOTES

TEST NO: 15. Bottom Ash emptied Start 10:51, stop 11.24, average start 11.16. Boiler Hopper Ash can not be cleaned out well enough for the amount of ash to be collected

Bottom Ash emptied at end of test,

TEST NO: Start 14:50, stop 15:13, average finish 15:02

Ash Collected for 3.22 hours

5 3/4 barrels of ash collected

average wt. of barrel 21 lbs

average wt of barrel + ash 260 lbs

TEST NO: average weight ash/barrel 239 lbs

Total Ash = 234 lbs/barrel × 5 3/4 barrels = 1374 lbs.

Rate = 1374 lbs / 3.22 hrs = 365 lbs/hr.

TEST NO:

TEST NO:

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 57,710

COAL, LB/HR 4900

LOAD, % 72.1%

TEST NO.	16				
DESCRIPTION:	normal O_2, OF.A ~60 Klbs				
	9-13-78				
COAL	Century				
TIME OF READING	15:07	14:04	15:01	15:18	
STEAM FLOW INTEGRATOR x 1000 lbs	950291	950348	950401	950417	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	0.7	0.7	0.7		
. 1 ZONE PRESS, "H_2O	0.30	0.30	0.30		
NO. 2 ZONE PRESS, "H_2O	0.50	0.50	0.50		
NO. 3 ZONE PRESS, "H_2O	0.55	0.55	0.55		
NO. 4 ZONE PRESS, "H_2O	0.60	0.60	0.60		
NO. 5 ZONE PRESS, "H_2O	0.30	0.30	0.30		
FURNACE DRAFT, "H_2O	-.03	-.03	-.03		
BOILER OUT DRAFT, "H_2O	-1.00	-1.05	-1.00		
ECONOMIZER OUTLET, "H_2O	-2.2	-2.2	-2.1		
DUST COLLECTOR OUT, "H_2O	-6.0	-6.5	-6.0		
HIGH OVERFIRE AIR, "H_2O	9.5	10.0	10.0		
LOW OVERFIRE AIR, "H_2O	10.0	9.5	9.5		
ILER DRUM LEVEL, "H_2O	-.2	.3	-.2		

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.	16				
DRUM PRESSURE, PSIG	212	212	215		
FEEDWATER PRESSURE, PSIG	337	333	337		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	58	62	58		
AIR FLOW, % (BLUE)	56	60	56		
FLUE GAS TEMP, °F (GREEN)	360	352	350		
STEAM PRESSURE, PSIG (PURPLE)	210	210	215		
SMOKE DENSITY, % (BLUE)	12	12	12		
CONTROLS					
MASTER	12.5/18.0	13.0/18.0	11.0/18.0		
STOKER	11.0/11.5	13.0/13.0	15.0/15.0		
F.D. DAMPER	17.0/17.5	18.0/18.0	18.0/18.0		
I.D. DAMPER	11.5/12.0	13.5/14.0	12.5/13.0		
FEEDWATER	12.5/12.5	13.5/13.5	12.0/12.0		
DRUM LEVEL	36.0/14.0	36.0/14.5	36.0/13.0		
COAL SCALE COUNTERS					
TIME OF READING	13:15			15:15	
COAL SCALE A X 200 LBS	1328			1352	
COAL SCALE B X 200 LBS	5155			5180	
UPPER OFA PRESSURE, "H_2O	10.0		10.0		
LOWER OFA PRESSURE, "H_2O	10.0		10.0		

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 79,726
COAL, LB/HR 6560
LOAD, % 93.4%

TEST NO.	17				
DESCRIPTION:	80 K lbs	normal O2	[illegible] as-ft	10"	
	9-14-78				
COAL	Century Coal				
TIME OF READING	11:09	12:03	13:10	13:46	
STEAM FLOW INTEGRATOR x 1000 lbs	951 426	951446	951585	951634	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	1.2	1.1	1.1		
NO. 1 ZONE PRESS, "H_2O	0.50	0.50	0.60		
NO. 2 ZONE PRESS, "H_2O	0.95	0.90	0.95		
NO. 3 ZONE PRESS, "H_2O	0.90	0.85	0.80		
NO. 4 ZONE PRESS, "H_2O	1.00	0.95	1.00		
NO. 5 ZONE PRESS, "H_2O	0.60	0.45	0.50		
FURNACE DRAFT, "H_2O	+.02	0	+.05		
BOILER OUT DRAFT, "H_2O	-1.40	-1.40	-1.35		
ECONOMIZER OUTLET, "H_2O	-3.1	-3.0	-3.1		
DUST COLLECTOR OUT, "H_2O	-10.0	-9.5	-8.7		
HIGH OVERFIRE AIR, "H_2O	10.0	10.0	10.0		
LOW OVERFIRE AIR, "H_2O	9.5	9.5	9.5		
BOILER DRUM LEVEL, "H_2O	+.1	+.1	+.1		

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	213	214	219		
FEEDWATER PRESSURE, PSIG	332	335	333		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	83	75	85		
AIR FLOW, % (BLUE)	82	72	84		
FLUE GAS TEMP, °F (GREEN)	370	367	380		
STEAM PRESSURE, PSIG (PURPLE)	203	205	206		
SMOKE DENSITY, % (BLUE)	35±2	24±6	36+4		
CONTROLS					
MASTER	16.0/20.0	15.0/20.0	14.5/20.0		
STOKER	16.5/16.5	18.0/17.5	17.0/17.0		
F.D. DAMPER	20.0/20.0	14.5/14.5	14.5/14.5		
I.D. DAMPER	35/32.5	23.0/33.0	35/32		
FEEDWATER	15.0/15.0	14.5/14.5	15.0/15.5		
DRUM LEVEL	36.0/13.5	36.0/13.5	36.0/13.0		
COAL SCALE COUNTERS					
TIME OF READING	1115		13:45		
COAL SCALE A X 200 LBS	565		605		
COAL SCALE B X 200 LBS	400		442		
UPPER OFA PRESSURE, "H_2O		10.0			
LOWER OFA PRESSURE, "H_2O		10.0			

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 71,124
COAL, LB/HR 5897
LOAD, % 889

TEST NO.	18				
DESCRIPTION:	80K - Low O2?; 50K, normal O.F.A				
	9-15-78				
COAL	Century				
TIME OF READING	10:46	11:46	12:46	13:44	
STEAM FLOW INTEGRATOR x 1000 lbs	952716	952788	952861	952927	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	0.8	0.9	0.9		
NO. 1 ZONE PRESS, "H_2O	0.30	0.35	0.30		
NO. 2 ZONE PRESS, "H_2O	0.60	0.65	0.65		
NO. 3 ZONE PRESS, "H_2O	0.60	0.65	0.65		
NO. 4 ZONE PRESS, "H_2O	0.65	0.70	0.70		
NO. 5 ZONE PRESS, "H_2O	0.25	0.30	0.27		
FURNACE DRAFT, "H_2O	-.11	-.10	-.10		
BOILER OUT DRAFT, "H_2O	-1.45	-1.40	-1.40		
ECONOMIZER OUTLET, "H_2O	-3.0	-3.0	-3.0		
DUST COLLECTOR OUT, "H_2O	-9.0	-3.0	-9.0		
HIGH OVERFIRE AIR, "H_2O	13.0	13.0	13.0		
LOW OVERFIRE AIR, "H_2O	12.0	12.0	12.0		
BOILER DRUM LEVEL, "H_2O	0	0	0		

Sheet 2 of 3

ABMA SITE D

KVB

TEST NO.					
DRUM PRESSURE, PSIG	218	218	220		
FEEDWATER PRESSURE, PSIG	340	338	341		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	74	74	74		
AIR FLOW, % (BLUE)	72	72	72		
FLUE GAS TEMP, °F (GREEN)	370	370	370		
STEAM PRESSURE, PSIG (PURPLE)	210	210	215		
SMOKE DENSITY, % (BLUE)	20	18	18		
CONTROLS					
MASTER	15.0/18.0	12.0/17.5	16.0/16.0		
STOKER	15.0/15.0	12.0/12.0	17.5/13.0		
F.D. DAMPER Hand	18.0/18.5	17.5/18.5	16.0/18.5		
I.D. DAMPER Hand	15.0/20.5	16.5/20.5	15.5/20.5		
FEEDWATER	14.5/14.5	14.5/14.5	14.5/14.5		
DRUM LEVEL	36.0/13.0	36.0/14.5	36.0/13.5		
COAL SCALE COUNTERS					
TIME OF READING	10:50		13:45		
COAL SCALE A X 200 LBS	833		875		
COAL SCALE B X 200 LBS	668		712	—	
UPPER OFA PRESSURE, "H_2O		130			
LOWER OFA PRESSURE, "H_2O		130			

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 53,217
COAL, LB/HR 4516
LOAD, % 66.5

TEST NO.	22				
DESCRIPTION:	SASS	SOx			
	9-21-78				
COAL	Victoria				
TIME OF READING	15:30	16:30	18:45	20:30	22.04
STEAM FLOW INTEGRATOR x 1000 lbs	960427	960477	960597	960689	960777
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	0.55	0.38	0.60	0.60	0.57
. 1 ZONE PRESS, "H_2O	0.23	0.15	0.30	0.25	0.20
NO. 2 ZONE PRESS, "H_2O	0.45	0.32	0.50	0.45	0.47
NO. 3 ZONE PRESS, "H_2O	0.42	0.30	0.50	0.45	0.45
NO. 4 ZONE PRESS, "H_2O	0.45	0.37	0.55	0.45	0.45
NO. 5 ZONE PRESS, "H_2O	0.30	0.23	0.37	0.37	0.38
FURNACE DRAFT, "H_2O	-.04	-.05	-.04	-.06	-.05
BOILER OUT DRAFT, "H_2O	-.90	-.75	-1.0	-1.0	-.95
ECONOMIZER OUTLET, "H_2O	-2.0	-1.6	-2.3	-2.1	-2.1
DUST COLLECTOR OUT, "H_2O	-5.7	-4.2	-6.5	-6.0	-6.0
HIGH OVERFIRE AIR, "H_2O	12.5	12.5	12.5	12.5	13.0
LOW OVERFIRE AIR, "H_2O	11.0	11.0	11.0	11.0	11.5
OILER DRUM LEVEL, "H_2O	-.2	-.5	-.3	-.3	-.3

Sheet 2 of 3 ABMA SITE D

KVB

TEST NO.	22				
DRUM PRESSURE, PSIG	200	200	200	202	202
FEEDWATER PRESSURE, PSIG	339	345	334	337	334
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	55	44	60	56	58
AIR FLOW, % (BLUE)	54	41	59	54	56
FLUE GAS TEMP, °F (GREEN)	345	340	350	345	345
STEAM PRESSURE, PSIG (PURPLE)	200	205	200	202	203
SMOKE DENSITY, % (BLUE)	11	11	12	13	12
CONTROLS					
MASTER	15.5/18.0	14.5/17.0	16.0/18.0	15.0/17.5	15.5/17.5
STOKER	15.0/15.0	12.0/12.0	16.0/16.0	14.0/14.0	13.0/13.0
F.D. DAMPER	17.5/17.5	16.0/16.5	18.0/18.0	17.0/17.0	17.0/17.0
I.D. DAMPER	12.0/12.0	20/20	14.5/14.5	18.0/18.0	12.0/12.0
FEEDWATER	12.0/12.0	10.0/10.0	12.0/12.0	18.0/18.0	13.0/13.0
DRUM LEVEL	36.0/14.0	36.0/14.0	36.0/14.0	36.0/14.5	36.0/15.0
COAL SCALE COUNTERS					
TIME OF READING	15:35				23:12
COAL SCALE A X 200 LBS	357				293444
COAL SCALE B X 200 LBS	288				237373
UPPER OFA PRESSURE, "H_2O		12.0			
LOWER OFA PRESSURE, "H_2O		18.0			

Sheet 3 of 3

KVB

ABMA SITE D

NOTES

TEST NO: 16:15 - load dropped to 42 klbs/hr
17:00 - load back up to 57 klbs/hr
Bottom Ash emptied from 17:45 to 18:15 - testing stopped
20:00 to 20:15 - Soot blown, testing stopped to
change filter. Resumed testing at 20:30

TEST NO: 23:10 - testing completed Steam integrator 960835

TEST NO:

TEST NO:

TEST NO:

Page 1 of 3

KVB

CONTROL ROOM DATA
ABMA TEST SITE D

STEAM, LB/HR 54,894
COAL, LB/HR 4441
LOAD, % 68.6

TEST NO.	23				
DESCRIPTION:	Test 57K				
	9-22-78				
COAL	Victoria				
TIME OF READING	10:30	11:22	12:16	12:51	
STEAM FLOW INTEGRATOR x 1000 lbs	961442	961489	961537	961571	
DRAFT GAUGES					
F.D. FAN PRESS, "H_2O	0.70	0.60	0.60		
.. 1 ZONE PRESS, "H_2O	0.27	0.22	0.25		
NO. 2 ZONE PRESS, "H_2O	0.55	0.50	0.50		
NO. 3 ZONE PRESS, "H_2O	0.52	0.47	0.50		
NO. 4 ZONE PRESS, "H_2O	0.60	0.50	0.50		
NO. 5 ZONE PRESS, "H_2O	0.30	0.32	0.38		
FURNACE DRAFT, "H_2O	-.03	-.05	-.03		
BOILER OUT DRAFT, "H_2O	-1.00	-1.00	-.92		
ECONOMIZER OUTLET, "H_2O	-2.2	-2.2	-2.0		
DUST COLLECTOR OUT, "H_2O	-6.8	-6.5	-6.0		
HIGH OVERFIRE AIR, "H_2O	13.0	13.0	13.0		
LOW OVERFIRE AIR, "H_2O	11.5	11.5	11.5		
ILER DRUM LEVEL, "H_2O	-.2	-.2	-.2		

Sheet [illegible] of 3

ABMA SITE D

KVB

ST NO.					
DRUM PRESSURE, PSIG	200	200	205		
FEEDWATER PRESSURE, PSIG	342	348	350		
CHART RECORDERS					
STEAM FLOW X 1000 LB/HR (RED)	56	57	51		
AIR FLOW, % (BLUE)	54	56	52		
FLUE GAS TEMP, °F (GREEN)	349	348	345		
STEAM PRESSURE, PSIG (PURPLE)	200	200	207		
SMOKE DENSITY, % (BLUE)	11	11	11		
CONTROLS					
MASTER	16.0/19.0	15.5/18.0	19.5/17.5		
STOKER	15.0/15.5	14.0/14.0	14.0/14.5		
F.D. DAMPER	17.5/17.5	17.0/17.5	17.0/17.0		
I.D. DAMPER	14.0/14.0	13.0/13.0	12.0/12.0		
FEEDWATER	12.0/12.0	12.0/12.0	11.5/11.5		
DRUM LEVEL	36.0/14.0	36.0/14.0	36.0/14.0		
COAL SCALE COUNTERS					
TIME OF READING	10:43			12:50	
COAL SCALE A X 200 LBS	581			604	
COAL SCALE B X 200 LBS	503			597	
UPPER OFA PRESSURE, "H_2O		12.5			
LOWER OFA PRESSURE, "H_2O		12.5			

SECTION 2.0

PARTICULATE DATA

PAGE

2.1 PARTICULATE DATA SUMMARY 52

2.2 PARTICULATE DATA SHEETS 56

2.3 PARTICULATE LAB WORKSHEETS 89

PARTICULATE DATA SUMMARY
PART I

LOCATION: ABMA SITE D - BR OUT

TEST NO.	Total Mass mgm.	Dry Gas Volume ft^3	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H_2O	Pitot ΔP "H_2O	Orifice ΔH "H_2O	Stack Gas Temp. °R	Excess O_2 %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10^6BTU	Flue Gas MW g/g mole
04	781.5	46.529	78.0	29.37	-1.3	.009	.437	796	9.3	95.5	0.624	0.837	9749	29.05
05	1497.6	63.773	93.3	29.18	-3.2	.0266	.416	827	7.9	132	0.504	0.837	9776	29.31
06	1498.0	86.868	124.8	29.34	-2.2	.011	1.1	825	8.7	100	0.749	0.837	9763	29.26
07	1826.2	96.820	130	29.67	-2.4	.018	1.34	814	10.2	110	0.690	0.837	9734	29.27
08	1530.0	78.080	104.1	29.63	-3.3	.0165	1.16	811	9.7	95	0.690	0.837	9721	29.27
09	853.9	55.80[illegible]	75.0	29.52	-2.2	.006	0.597	789	11.5	90	0.749	0.837	9672	29.[illegible]
10	1429.1	83.0[illegible]	110	29.65	-2.2	.014	1.03	804	9.9	105.5	0.691	0.837	9771	29.35
12	1451.5	47.690	85	29.49	-3.2	.0185	0.89	822	8.4	66	0.624	0.837	9669	29.20
13	1118.4	45.57	76	29.50	-3.26	.016	0.786	822	7.4	66	0.624	0.837	9796	29.3
14	1805.7	46.118	79.6	29.31	-3.0	.0179	0.837	820	7.5	66	0.624	0.837	9759	29.3
15	1518.3	52.386	72.7	29.55	-3.2	.002	0.961	810	7.8	68.25	0.624	0.837	9719	29.41
16	1179.0	54.211	73	29.57	-2.4	.014	1.08	793	8.7	66	0.691	0.837	9640	29.35
17	1535.0	48.044	79	29.25	-2.7	.018	0.879	815.5	7.3	66.25	0.624	0.837	9715	29.31
18	1242.0	47.362	67.2	29.46	-3.5	.0247	0.975	811	8.1	66	0.624	0.837	9743	29.34
23	844.4	46.861	57	30.09	-2.4	.0168	0.790	790	10.4	66	0.624	0.837	9732	29.35

PARTICULATE DATA SUMMARY
PART I

LOCATION: ABMA SITE D - STACK (DC OUT)

TEST NO.	Total Mass mgm.	Dry Gas Volume ft^3	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H_2O	Pitot ΔP "H_2O	Orifice ΔH "H_2O	Stack Gas Temp. °R	Excess O_2 %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10^6BTU	Flue Gas MW g/g mole
03	593.3	73.24	88.3	29.73	0	0.079	0.685	778	10.6	120.5	0.385	0.817	9774	29.18
04	364.8	27.56	45.0	29.37	0	0.04	0.34	780	10.0	64	0.385	0.817	9799	29.12
05	1026.9	65.93	99.0	29.18	0	0.058	0.44	779	8.4	120	0.385	0.817	9776	29.25
06	244.6	32.600	52.3	29.34	0	0.0425	0.2755	778	9.8	80.17	0.385	0.817	9763	29.13
07	300.8	27.800	38	29.67	0	0.0544	0.39	785	10.4	60.83	0.385	0.817	9734	29.21
08	192.8	25.49	27.2	29.63	0	0.0658	0.452	792	10.5	52.13	0.385	0.817	9721	29.36
09	382.1	43.35	47.6	29.52	0	0.0275	0.309	752	12.2	100.2	0.440	0.817	9672	29.16
10	485.2	59.64	79.6	29.65	0	0.046	0.55	760	10.5	111.3	0.440	0.817	9771	29.21
12	575.8	33.570	53	29.49	0	0.065	0.42	820	9.3	72	0.385	0.817	9669	29.23
13	364.4	26.44	41.7	29.50	0	0.070	0.45	800	8.3	57	0.385	0.817	9796	29.33
14	295.9	14.15	34.6	29.31	0	0.0486	0.345	800	9.2	33	0.385	0.817	9759	28.87
15	384.2	37.57	46.5	29.55	0	0.0587	0.413	800	8.7	70.25	0.385	0.817	9719	29.36
16	211.6	26.35	37.5	29.57	0	0.0495	0.347	765	9.6	68.5	0.385	0.817	9640	29.24
17	359.5	32.14	57.7	29.25	0	0.065	0.4608	791	7.9	69.25	0.385	0.817	9715	29.19
18	333.5	29.73	43.2	29.46	0	0.073	0.514	792	8.8	60.317	0.385	0.817	9743	29.26
23	308.9	23.07	32	30.09	0	0.044	0.302	766	10.9	57	0.385	0.817	9732	29.23

#15900 rev.

PARTICULATE DATA SUMMARY
PART II

Location SITE D BLR OUT

TEST NO.	LOAD %	O_2 %	CONDITIONS	EMISSIONS			Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
				lb/10^6BTU	GR/SCF	LB/HR				
4	64	9.3	Med Load - Norm O_2 - 6" OFA	0.664	0.264	38	7.48	6.57	277	96
5	86	7.9	High Load - Norm O_2 - 10" OFA	0.832	0.371	78	6.63	10.14	407	96
6	65	8.7	Med. Load - Norm O_2 - 5" OFA	0.694	0.291	45	6.92	7.29	303	99
7	63	10.2	Med. Load - Norm O_2 - 15" OFA	0.793	0.293	58	6.01	9.32	387	100
8	66	9.7	Med. Load - Norm O_2 - 10" OFA	0.788	0.305	58	5.98	8.92	371	
9	45	11.5	Low Load - Norm O_2 - 10" OFA	0.732	0.239	28	6.06	5.32	227	101
10	63	9.9	Med Load - Norm O_2 - 10" OFA	0.707	0.267	47	5.94	8.16	343	100
12	87	8.4	High Load - High O_2 - 10" OFA	1.097	0.476	95	7.88	9.55	390	101
13	89	7.4	High Load - Norm O_2 - 5" OFA	0.837	0.387	72	7.47	8.86	362	102
14	87	7.5	High Load - Norm O_2 - 7" OFA	1.336	0.615	121	7.69	9.39	382	99
15	88	7.8	High Load - Norm O_2 - 15" OFA	1.000	0.452	95	6.23	9.81	407	101
16	64	8.7	Med Load - Norm O_2 - 10" OFA	0.798	0.339	60	6.05	8.12	345	104
17	87	7.3	High Load - Norm O_2 - 10" OFA	1.072	0.503	99	7.37	9.39	384	101
18	79	8.1	Norm Conditions — SOx	0.969	0.427	99	6.39	10.94	452	
23	61	10.4	Med Load - Norm O_2 - 13" OFA	0.762	0.276	54	5.41	8.80	382	100

#15900 Rev.

PARTICULATE DATA SUMMARY
PART II

Location Site D - DC. out

TEST NO.	LOAD %	O_2 %	CONDITIONS	EMISSIONS			Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
				lb/10^6BTU	GR/SCF	LB/HR				
3	69	10.1	Med Load - Norm O_2 - 6" OFA	0.355	0.126	45	5.43	18.59	698	105
4	64	9.3	Med Load - Norm O_2 - 6" OFA	0.557	0.208	53	7.30	13.36	494	106
5	86	7.9	High Load - Norm O_2 - 10" OFA	0.574	0.246	75	6.79	16.07	591	112
6	65	8.7	Med. Load - Norm O_2 - 5" OFA	0.372	0.142	37	7.19	13.74	509	97
7	63	10.2	Med. Load - Norm O_2 - 15" OFA	0.488	0.168	50	6.13	15.50	576	96
8	66	9.7	Med. Load - Norm O_2 - 10" OFA	0.328	0.118	38	4.85	17.09	628	92
9	45	11.5	Low Load. - Norm O_2 - 10" OFA	0.456	0.138	30	5.01	10.82	417	94
10	63	9.9	Med. Load - Norm O_2 - 10" OFA	0.354	0.127	35	5.99	14.03	538	92
12	87	8.4	High Load - High O_2 - 10" CFA	0.667	0.268	85	7.05	17.37	614	92
13	89	7.4	High Load - Norm O_2 - 5" OFA	0.490	0.212	70	6.92	17.77	644	89
14	87	7.5	High Load - Norm O_2 - 7" OFA	0.754	0.329	91	10.57	14.97	539	97
15	88	7.8	High Load - Norm O_2 - 15" OFA	0.424	0.179	54	6.23	16.25	590	97
16	64	8.7	Med. Load - Norm O_2 - 10" OFA	0.319	0.125	36	6.38	14.62	555	84
17	87	7.3	High Load - Norm O_2 - 10" OFA	0.393	0.176	56	8.00	17.14	623	91
18	79	8.1	Norm Conditions — SOx	0.421	0.176	60	6.53	18.09	661	90
23	61	10.4	Med. Load - Norm O_2 - 13" OFA	0.595	0.205	56	6.13	13.67	528	91

#15900 Rev.

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

Sampling Time Per Point, Min

ISOKINETICS = ______%

TEST NUMBER 1
DATE 7/28/78
OPERATOR [illegible]
FUEL [illegible]
SITE D
PROBE LOCATION [illegible]

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔPₛ	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port #4 2	9:43	.01	.26	2634.83	318	300	285		50	80		3.2
3		.015	.34	2637.32		310	245		65	83		3.3
4		.01	.26	2639.24		310	300		65	86		3.5
5		.01	.26	2641.69		315	315		68	90		4.2
6		.01	.26	2642.78		315	315		68	92		4.2
Port 3 2		.01	.26	2644.60		295	300		75	89		4.3
3		.01	.26	2645.35		290	305		68	102		4.3
4		.01	.26	2648.47		315	305		70	105		4.3
5		.015	.39	2650.03		300	305		68	108		5.2
6		.015	.39	2652.14		295	310		68	110		5.4
Port #2 1		.015	.39	2654.41		305	310		78	118		5.5
2		.015	.38	2656.46		310	320		63	115		5.5
3		.015	.38	2658.46		320	320		68	120		5.5
4		.015	.38	2660.48		300	310		68	120		5.5
5		.01	.25	2662.22		300	310		68	120		4.7
6		.01	.25	2663.75		280	310		69	112		4.7
					✓							
Port 5 1		.01	.25	2665.57	318	—	290		68	122		5.0
2		.01	.25	2667.29	300	—	285		70	122		4.9
Port 6 1		.015	.38	2669.41	340	—	300		68	122		5.8
2		.005	.125	2670.5	330	-	300		68	122		3.2
Port 7 1		.02	.51	2673.17	340	—	340		70	122		3.2
2		.01	.25	2675.225	330	—	320		68	122		4.5
Average	.017	.33			320							

METER VOL. END ______
START [illegible]
SAMPLE VOL. [illegible] ft³ Corr.

Meter Corr. 1.0516

C pitot	Stack Press. In. H₂-Gauge	Barometric Pressure
.83	-2.6	[illegible]

Percent O₂ = ______

Nomograph Setup

T_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal)=
% H₂O = Noz(Actual)= [illegible]
= [illegible]

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	156	-	100	=	56
#2	112	-	100	=	12
#3	[illegible]	-	0	=	0
				Total	
#4	g(End)		g(Start)		Grams
Silica Gel	[illegible]	-	[illegible]	=	[illegible]

Total Vol. H₂O [illegible]

PARTICULATE

DATA

Sampling Time Per Point, Min
4

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

ISOKINETICS = ______ %

TEST NUMBER ______
DATE 7/28/78
OPERATOR JD
FUEL Ohio
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.02	.18	3214.94	300	230	220		70	71		1.4
2		.02	.18	3216.29	300	235	200		59	71		1.4
3		.02	.18	3817.60	310	248	235		60	73		1.4
4		.02	.18	3218.91	310	245	230		58	76		1.4
5		.02	.18	3220.28	315	240	220		58	80		1.4
6		.02	.18	3221.54	310	240	205		60	80		1.4
7		.07	.61	3223.91	318	240	235		60	80		5.0
8		.09	.80	3226.54	318	242	225		58	80		6.2
9		.11	.96	3229.46	318	240	235		55	81		7.0
10		.16	1.4	3233.80	318	250	250		58	85		9.6
11		.09	.80	3236.41	310	240	260		58	85		6.2
12		.11	.96	3239.30	295	245	240		58	84		7.0
1		.02	.18	3240.62	310	200	250		69	80		2.7
2		.02	.18	3241.85	315	230	230		61	81		1.9
3		.02	.18	3243.59	315	235	235		64	85		1.4
4		.03	.26	3245.11	318	242	250		60	89		2.3
5		.02	.18	3246.47	318	245	250		70	90		1.6
6		.03	.26	3247.96	320	240	260		65	90		8.0
7		.07	.61	3250.28	320	240	260		60	90		6.0
8		.07	.61	325[illegible].53	320	170	260		62	90		6.0
9		.06	.54	3254.69	320	105	255		68	90		5.3
10	5 min	.09	.80	3257.48	320	95	260		60	91		7.0
11		.10	.90	3260.22	320	80	290		60	91		9.0
12		.07	.61	3262.30	300	80	280		63	91		6.0
Average		.056	.496		313.2							

METER VOL. END ______
START 3213.60
SAMPLE VOL. 48.9 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	——	29.61

Percent O_2 = ______

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
$\Delta H_@$ =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal) =
Noz(Actual) =
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	144	-	100	=	44
#2	104	-	100	=	4
#3	0	-	0	=	0
				Total	48
#4	g(End)		g(Start)		Δgrams
Silica Gel	160.8	-	148.5	=	11.5
				Total Vol. H_2O	59.5 ml

PARTICULATE

DATA

Leak Check Rate

Vac
in. Hg ft³/min

Sampling Time Per Point, Min
5

Before

After

ISOKINETICS = 105 %

TEST NUMBER 3

DATE 8/3/78

OPERATOR SD

FUEL Ohio

SITE D

PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		.07	.26	3267.24	710	210	210		100	60		1.5
2		.04	.35	3269.57	315	230	230		51	60		1.5
3		.03	.26	3271.64	310	240	240		50	61		1.5
4		.04	.35	3274.07	320	250	250		57	62		1.5
5		.10	.90	3277.61	320	260	260		52	68		5.0
6		.09	.80	3290.00	325	280	280		50	70		4.9
7		.12	1.0	3284.43	330	275	275		51	71		5.8
8		.09	.80	3287.75	330	255	255		52	72		4.8
9		.14	1.2	3291.40	320	265	265		52	75		6.7
10		.09	.80	3294.65	330	275	270		52	78		4.8
11		.08	.67	3297.68	320	272	270		52	78		4.2
12		.07	.60	3300.73	320	270	270		50	80		4.0
1		.03	.26	3202.71	310	160	250		60	80		1.6
2		.04	.35	3305.08	320	240	275		61	80		20
3		.03	.26	3307.08	320	240	290		70	80		1.6
4		.03	.26	3309.03	320	280	265		54	80		1.6
5		.03	.26	3310.99	320	280	285		59	80		1.6
6		.04	.35	3313.25	320	180	140		50	80		20
7		.14	1.2	3317.51	320	270	190		50	80		6.8
8		.14	1.2	3321.56	320	250	225		49	80		7.0
9		.5	1.3	3325.80	320	265	250		45	80		7.0
10	55m	.11	.95	3329.34	320	265	250		45	80		5.0
11		.13	1.1	3333.65	300	270	260		48	90		6.8
12		.11	.95	3337.92	300	270	265		45	30		5.8
Average		.074	.685	73.24	318							

METER VOL. END
START 3264.08
SAMPLE VOL. 73.24 ft³

C_{pitot}	Stack Press. In. H_2O-Gauge	Barometric Pressure
.817	0	29.73

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH@ = Noz(Ideal)=
% H_2O = Noz(Actual)= .385

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	160	-	100	=	60
#2	109	-	100	=	9
#3	0	-	0	=	0
				Total	69
#4	g(End)		g(Start)		Δgrams
Silica Gel	166.0	-	146.7	=	19.3

Total Vol. H_2O 88.3 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5.0

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 95.6 %

TEST NUMBER 4
DATE 8/15/78
OPERATOR RAD
FUEL Ohio
SITE D
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port 4 1		.005	.225	2736.425	305	290	320		90	98		2.5
2	5.25	.005	.225	2738.428	330	295	320		92	103		2.5
3	5.25	.005	.225	2740.40	335	300	320		82	108		2.3
4		.000	—	—	—	—	—	—	—	—	—	—
5		.005	.225	2742.245	280	300	320		82	111		2.3
Port 3 1		.005	.225	2744.12	325	250	300		90	120		2.3
2		.005	.225	2745.84	355	280	300		82	121		2.3
3		.005	.225	2747.63	355	300	300		75	123		2.3
4		.005	.225	2749.388	355	300	300		75	128		2.3
5		.000	—	—	—	—	—	—	—	—	—	
Port 2 1		.015	.70	2752.40	340	240	240		88	132		4.5
2		.010	.47	2754.80	360	300	300		72	132		3.5
3		.010	.47	2757.30	360	305	305		70	133		3.5
4		.010	.47	2759.72	355	300	300		70	138		3.3
5		.005	.225	2761.54	355	305	305		73	140		2.4
6		.000	—	—	—	—	—	—	—	—	—	.
Port 5 1		.02	.93	2765.02	330	330	280		70	138		6.0
2		.01	.46	2767.44	—	320	310		70	138		3.4
Port 6 1		.01	.46	2769.82	—	270	300		78	139		3.5
2		.02	.93	2773.21	320	290	295		70	138		6.7
Port 7 1		.02	.93	2776.43	340	270	295		70	141		10.5
2		.01	.46	2778.650	320	240	290		80	142		—
Average		.009	.437		336							

METER VOL. END 2784.404
START 2737.65
SAMPLE VOL. 46.529 ft^3 Corr.

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-1.3 "H$_2$O	2977

Percent O$_2$ =

1.0516 Meter Corr.

Nomograph Setup

P$_{meter}$ =
P$_{stack}$ =
T$_{meter}$ =
ΔH$_g$ =
% H$_2$O =

C =
T$_{stack}$ =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	156	-	100	=	56
#2	108	-	100	=	8
#3	0	-	0	=	0
				Total	64
#4	g(End)		g(Start)		Δgrams
Silica Gel	154	-	140	=	14
				Total Vol. H$_2$O	78 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
4

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 106 %

TEST NUMBER 4
DATE 5/15/75
OPERATOR JD
FUEL Ohio
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
1		0.00										
2		000										
3		0.00.										
4		0.00										
5		.01	.10	3339.81	320	240	215		75	90		1.0
6		.03	.26	3341.39	320	270	180		70	90		1.6
7		.05	.42	3343.59	320	270	225		71	95		2.6
8		.05	.42	3345.35	320	290	240		75	100		2.6
9		.07	.60	3347.59	320	290	260		75	100		3.0
10		.04	.35	3349.39	320	290	280		75	100		2.2
11		.02	.17	3350.50	260	280	280		75	100		1.2
12		.08	.70	3352.97	320	290	290		80	105		5.0
1		0.00										
2		0.00										
3		0.00										
4		.03	.26	3354.48	320	270	300		70	100		1.6
5		.03	.26	3355.96	320	300	300		75	102		1.7
6		.04	.35	3357.74	320	305	310		64	108		2.0
7		.05	.42	3359.64	320	300	305		62	105		2.6
8		.05	.42	3361.79	320	300	300		62	106		2.6
9		.04	.32	3363.48	320	295	295		70	108		2.0
10		.03	.26	3364.96	320	290	300		70	110		1.9
11		.02	.17	3366.28	320	282	300		70	105		1.4
12		0.00										
Average		.04	.34	27.56	320							

METER VOL. END
START 3338.72
SAMPLE VOL. 27.56 ft^3

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	0"H_2O	29.37

Percent O$_2$ =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
$\Delta H_@$ =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=
=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	132	- 100	= 32
#2	104	- 100	= 4
#3	0	- 0	= 0
		Total	36
#4	g(End)	g(Start)	Δgrams
Silica Gel	156.0	- 146.8	= 9.2
		Total Vol. H_2O	45.2 ml

PARTICULATE

DATA

Leak Check Rate

Vac
in. Hg ft^3/min

Before

After

Sampling Time Per Point, Min
6.0

ISOKINETICS = 96.8 %

TEST NUMBER 5
DATE 8/16/79
OPERATOR RAP
FUEL Oil
SITE D
PROBE LOCATION BLROUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
7 1	13:07	.04	.87	2783.48	340	270	280		80	82		6.1
2		.045	.94	2788.18	—	290	285		80	82		6.2
#6 1		.035	.72	2792.37	345	290	290		72	90		4.8
2		.035	.72	2796.20	—	305	305		68	91		4.8
#5 1		.02	.42	2799.08	340	305	305		70	98		2.2
2		.015	.31	2801.58	—	315	315		70	98		2.8
#4 1	14:17	.01	.20	2803.62	350	290	290		70	102		2.3
2		.01	.20	2805.62	360	310	300		67	102		2.3
3		.005	.10	2807.14	350	290	290		67	103		1.8
4		.01	.20	2809.06	360	310	300		67	110		2.3
5		.015	.29	2811.42	360	310	290		67	112		2.8
#3 1		.03	.58	2814.70	365	315	295		72	118		4.3
2		.025	.49	2817.72	—	310	310		68	118		4.0
3		.02	.34	2820.50	380	250	295		65	120		2.8
4		.015	.29	2822.80	385	300	300		66	121		2.0
5		.015	.29	2825.10	385	320	310		68	122		2.0
#2 1		.03	.58	2828.42	380	300	310		62	125		4.8
2		.03	.58	2831.64	—	—	—	—	—	—	—	—
3		.02	.39	2834.38	380	300	300		68	125		3.8
4		.01	.20	2836.15	380	320	320		67	128		2.8
5		.01	.20	2837.96	380	320	310		67	129		2.8
6		.01	.20	2839.757	360	290	305		70	130		2.8
Average		.0206	.416		366.8							

METER VOL. END
START 2779.114
SAMPLE VOL. 63.776 ft^3 Corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-3.2" H_2O	29.18

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)= .504

T = .09

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	172	-	100	=	72
#2	112	-	100	=	12
#3	2	-	0	=	2
				Total	86
#4	g(End)		g(Start)		Δgrams
Silica Gel	145.3	-	138	=	7.3
				Total Vol. H_2O	93.3 ml

Meter. Corr.-1.0516

PARTICULATE

DATA

Leak Check Rate

Vac
In. Hg ft³/min

Sampling Time Per Point, Min
5

Before

After

ISOKINETICS = 113 %

TEST NUMBER 5
DATE 8/16/78
OPERATOR JD
FUEL Ohio
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
B 1		.03	.26	3368.65	325	260	240		58	50		20
2		.05	.42	3371.92	330	270	220		52	65		2.6
3		.07	.60	3374.48	340	275	240		55	69		3.3
4		.06	.56	3377.26	340	280	230		55	70		3.0
5		.09	.75	3380.67	340	275	228		56	70		5.0
6		.09	.75	3384.01	340	280	245		55	70		5.0
7		.08	.67	3387.17	340	280	259		55	72		4.7
8		.08	.67	3390.32	340	275	265		55	72		4.7
9		.07	.60	3393.49	340	275	245		55	75		3.3
10		.04	.32	3395.78	340	270	250		55	78		2.4
11		.05	.42	3397.77	340	210	225		55	78		3.4
12		.03	.26	3400.40	340	250	230		55	80		2.2
A 1		.02	.17	3402.21	340	220	210		65	72		1.6
2		.02	.17	3403.78	340	270	225		60	75		1.6
3		.03	.17	3405.90	340	295	245		60	75		2.2
4		.03	.26	3407.55	340	300	250		60	80		2.2
5		.03	.26	3409.94	340	300	250		60	80		2.2
6		.06	.26	3412.61	340	300	260		58	80		4.0
7		.12	.50	3416.37	240	300	240		60	83		6.5
8		.12	1.0	3 20.09	345	240	260		55	85		6.5
9		.11	1.0	3423.74	345	240	260		57	87		6.2
10		.11	.45	3427.38	345	285	280		57	90		6.2
11		.06	.45	3430.06	345	290	275		57	90		4.0
12		.04	.32	3432.31	326	280	270		57	90		2.4
Average		.058	.44		339							

METER VOL. END
START 3366.39
SAMPLE VOL. 65.92 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	0.00" Hg	29.18

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal) =
% H_2O = Noz(Actual) =

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	171	-	100	=	71
#2	113	-	100	=	13
#3	0	-	0	=	
				Total	84
#4	g(End)		g(Start)		Δgrams
Silica Gel	147.2	-	132	=	15.2
				Total Vol. H_2O	99.2 ml

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 99.8%

Sampling Time Per Point, Min
5.0

TEST NUMBER 6
DATE 8/18/78
OPERATOR RAP
FUEL Ohio
SITE D
PROBE LOCATION BH OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
#2 1	8:55	.025	2.5	2845.43	345	260	240		62	88		16.2
2		.025	2.5	2851.26	350	270	270		65	88		16.4
3	5:25	.015	1.5	2856.01	350	310	280		68	90		9.2
4		.01	1.0	2859.75	345	310	280		63	90		6.6
5	6.0	.01	1.0	2863.54	340	300	285		63	90		6.6
6		.01	1.0	2867.47	—	300	290		65	90		6.8
#3 1		.01	1.0	2871.36	340	250	290		63	90		6.8
2		.005	.50	2874.60	350	300	310		78	90		4.5
3		.015	1.5	2879.24	350	310	310		68	92		9.5
4		.01	1.0	2883.02	345	310	310		65	93		7.2
5		.01	1.0	2886.80	—	310	310		68	92		7.2
#4 1		0.000										
2		.005	.50	2889.57	330	250	310		68	97		4.8
3		.005	.50	2892.38	340	310	315		68	98		5.0
4		.005	.50	2895.08	340	310	320		68	100		5.0
5		0.00										
#5 1		.005	.50	2897.74	345	320	305		70	102		4.8
2		.01	1.0	2901.52	—	320	305		70	102		7.5
#6 1		.015	1.5	2906.05	350	290	240		71	103		10.2
2		.005	.50	2908.67	—	300	295		70	103		5.0
#7 1		.015	1.5	2913.21	350	320	290		71	103		10.2
2		.01	1.0	2916.075	—	320	300		72	103		7.5
Average		.011	1.1		345							

METER VOL. END
START 2839.905
SAMPLE VOL. 80.164 ft^3 Corr.

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-2.2 " H$_2$O	29.34

Percent O$_2$ =

Meter corr. 1.0516

Nomograph Setup

P$_{meter}$ =
P$_{stack}$ =
T$_{meter}$ =
ΔH$_g$ =
% H$_2$O =

C =
T$_{stack}$ =
ΔP =
Noz(Ideal) =
Noz(Actual) = .249

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	187	-	100	=	87
#2	118	-	100	=	18
#3	2	-	0	=	2
				Total	
#4	g(End)		g(Start)		Δgrams
Silica Gel	154.5	-	141.7	=	17.8

Total Vol. H$_2$O 124.1 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
4.0

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS = 97 %

TEST NUMBER 6
DATE 8/18/78
OPERATOR SD
FUEL Ohio
SITE D
PROBE LOCATION 3432.49

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
A 1		0.00										
2		0.00										
3		0.00										
4		.02	.14	3433.73	315	265	230		62	75		1.0
5		.02	.14	3435.05	320	295	250		60	70		1.0
6		.05	.32	3436.87	300	310	275		54	80		2.1
7		.06	.41	3438.86	320	310	290		60	81		2.4
8		.10	.70	3441.39	320	300	300		60	85		5.0
9		.04	.28	3442.98	320	310	310		65	89		2.0
10		.05	.32	3444.74	320	310	340		65	90		2.2
11		.05	.32	3446.51	320	280	300		75	99		2.2
12		.03	.20	3447.98	320	275	280		65	100		1.6
B 1		0.00										
2		.02	.14	3449.19	300	200	210		80	90		1.3
3		.02	.14	3450.28	320	275	245		70	95		1.3
4		.02	.14	3451.50	320	290	260		70	95		1.3
5		.05	.32	3453.27	320	300	270		75	98		2.0
6		.05	.32	3455.00	320	280	275		75	90		2.0
7		.06	.41	3457.00	320	280	295		70	90		2.6
8		.08	.55	3459.71	320	280	290		65	91		4.2
9		.04	.28	3460.90	320	280	280		70	90		2.0
10		.04	.28	3462.50	320	280	280		70	90		2.0
11		.03	.20	3463.86	320	280	280		70	90		1.5
12		.02	.14	3465.09	300	280	290		71	95		1.3
Average		.0425	.2755		312.6							

METER VOL. END
START 3432.49
SAMPLE VOL. 32.600 ft³

C_pitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	0.0" H₂O	29.34

Percent O₂ =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
$\Delta H_@$ =
% H_2O =
C =
T_{stack} =
ΔP =
Noz(Ideal) =
Noz(Actual) =
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	136	-	100	=	36
#2	107	-	100	=	7
#3	0	-	0	=	0
				Total	43

#4	g(End)		g(Start)		Δgrams
Silica Gel	155	-	145.7	=	9.3

Total Vol. H_2O 52.3 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5.0

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS = 100.1

* Homograph change .026

TEST NUMBER 7
DATE 8-22-78
OPERATOR RAP
FUEL Ohio
SITE D
PROBE LOCATION BUR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
#7 1	17:25	.03	2.3	2922.66	360	320	310		73	100		14.0
2		.025	1.95	2927.84	385	315	295		72	100		12.2
#6 1		.03	2.3	2933.32	360	320	295		72	100		14.0
2		.025	1.95	2938.41	330	310	310		71	98		12.2
#5 1		.02	1.55	2942.98	345	320	320		73	98		9.3
2		.01	.97	2946.62	—	310	320		73	97		6.3
#4 1		.01	.47	2951.73	340	320	255		75	95		6.3
2		.005	.39	2954.16	340	220	260		73	95		3.8
3		.01	.70	2957.34	340	315	280		73	98	*	5.0
4		.01	.70	2960.45	340	315	285		70	98		5.2
5		.015	1.05	2964.31	—	315	300		70	95		7.0
#3 1		.02	1.40	2968.60	350	270	315		67	95		9.0
2		.02	1.40	2973.03	360	290	315		68	95		9.2
3		.02	1.40	2977.43	355	310	320		69	95		9.2
4		.015	1.05	2981.30	355	310	330		70	95		7.8
5		.02	1.40	2985.62	330	310	320		69	96		9.5
#2 1		.025	1.75	2990.54	370	270	330		70	92		11.8
2		.025	1.75	2995.46	365	310	310		70	92		11.4
3		.02	1.40	2999.80	365	320	310		70	92		10.0
4		.01	.70	3002.95	365	320	305		70	92		6.4
5		.03	2.1	3008.46	370	300	300		70	93		16.3
6		.005	.35	3010.655	—	290	300		—	93		3.5
Average		.018	1.34		353.9							

METER VOL. END
START 2917.95
SAMPLE VOL. [illegible].820 ft³ Corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-2.4" H_2O	29.67

Percent O_2 =

Meter. Corr. 1.056

Homograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal) =
Noz(Actual) = .690
φ = .024

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	184	-	100	=	84
#2	122	-	100	=	22
#3	4	-	0	=	4
				Total	110
#4	g(End)		g(Start)		Δgrams
Silica Gel	159.0	-	139.0	=	20

Total Vol. H_2O 130 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
4.0

Leak Check Rate

Vac in. Hg   ft^3/min

Before

After

ISOKINETICS = 99.3.

TEST NUMBER 7
DATE 8/22/78
OPERATOR JD
FUEL Ohio
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
B 1		0.00										
2		0.00										
3		0.03	.21	—	320	300	290	—	60	88		1.2
4		0.00										
5		0.00										
6		.016	.11	—	320	300	305		65	88		1.0
7		.05	.32	3470.76	325	300	310		60	89		2.0
8		.05	.32	3472.56	325	305	310		60	89		8.0
9		.09	.62	3474.95	325	310	280		60	90		4.2
10		.06	.41	3476.91	325	310	300		63	90		2.3
11		.06	.41	3478.91	325	310	310		63	92		2.3
12		.04	.28	3480.47	280	310	320		68	92		1.8
A 1		0.00										
2		0.00										
3		0.00										
4		0.00										
5		0.00										
6	*53K	.03	.21	3482.01	325	240	250		60	90		1.5
7		.04	.28	3483.61	325	240	252		59	90		2.0
8		.06	.41	3485.63	330	280	285		55	90		2.5
9		.09	.62	3487.02	330	300	300		59	90		4.5
10		.09	.62	3490.39	330	310	310		59	91		4.2
11		.09	.62	3492.73	330	310	320		59	91		4.5
12		.02	.14	3493.99	215	315	310		60	91		1.2
Average		.0544	0.39		325							

METER VOL. END
START 3466.19
SAMPLE VOL. 27.80 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	0" H_2O	29.67

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
$\Delta H_{@}$ =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	126	-	100	=	26
#2	103	-	100	=	3
#3	0	-	0	=	6
				Total	29
#4	g(End)		g(Start)		Δgrams
Silica Gel	155.6	-	147.0	=	9

Total Vol. H_2O 38 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5.0

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After	1	

ISOKINETICS = 97.5

*new filter

TEST NUMBER 8
DATE 8/23/78
OPERATOR RAP
FUEL Ohio
SITE D
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
#2 1	11:35	.03	2.1	3016.32	370	300	310		—	90		16.0
2		.025	2.45	3022.12	365	280	300		—	90		21.0
3		.025	1.75	30 6.97	360	310	315		80	90		12.0
4		.015	1.05	3030.82	355	305	310		70	90		7.5
5		.015	1.05	3034.66	350	300	310		68	90		7.8
6		.01	.70	3037.88	330	300	310		65	90		5.8
#3 1		.025	1.75	3042.77	350	—	280		70	90		12.2
2		.025	1.75	3046.88	360	270	270		65	90		13.5
3		.02	1.40	3051.67	355	240	260		70	70	*	8.0
4		.01	.70	3054.89	360	270	265		62	90		5.2
5		.015	1.05	3058.89	330	295	265		62	90		7.2
#4 1		0.00										
2		.005	.35	3061.10	340	250	275		72	91		3.8
3		.005	.35	3063.38	345	280	300		65	91		3.8
4		.01	.70	3066.53	345	300	310		68	91		5.5
5		.01	.70	3069.70	330	200	310		68	92		5.5
#5 1		.015	1.05	3073.58	365	250	265		80	96		7.5
2		.01	.70	3076.71	—	300	270		70	98		5.0
#6 1		.02	1.40	3081.21	360	320	290		72	100		9.5
2		.015	1.05	3085.074	—	320	295		69	102		7.8
#7	—	Lost	Load									
Average		.0165	1.16		351.1							

Nomograph Setup

METER VOL. END 3085.074
START 3010.825
SAMPLE VOL. 78.04 ft^3 Corr.

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-3.3"H_2O	29.68

Percent O$_2$ =

P$_{meter}$ =
P$_{stack}$ =
T$_{meter}$ =
ΔH$_g$ =
% H_2O =

C =
T$_{stack}$ =
ΔP =
Noz(Ideal) =
Noz(Actual) = .690
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	164	-	100	=	64
#2	119	-	100	=	19
#3	6	-	0	=	6
				Total	89
#4	g(End)		g(Start)		Δgrams
Silica Gel	154.0	-	143.9	=	15.1

Total Vol. H_2O 104.1 ml

Meter correction - 1.0516

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

Sampling Time Per Point, Min
4.0

ISOKINETICS = 99.6.

TEST NUMBER 8
DATE 8/23/78
OPERATOR DD
FUEL Ohio
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
A 1		0.00										
2		0.00										
3		0.00										
4		0.00										
5		0.00										
6		0.00										
7		.05	.32	3488.07	320	240	240		61	70		1.8
8		.10	.70	3492.80	320	305	270		57	71		4.0
9		.12	.83	3495.59	320	310	300		58	79		4.5
10		.11	.75	3498.27	330	320	310		60	70		4.2
11		.09	.62	3500.73	330	330	320		65	85		3.
12		.07	.49	3502.87	320	310	320		68	90		2.0
B 1		.02	.14	3503.67	340	280	255		70	95		1.0
2		.04	.28	3505.30	340	295	270		65	95		1.6
3		.03	.20	3506.54	340	300	240		70	98		1.3
4		0.00										
5		.015	.10	3507.55	340	310	245		75	100		.8
6		0.00										
7		.07	.44	3509.61	340	295	245		72	100		2.4
8		.09	.62	3511.95	340	300	250		70	100		4.0
9		.05	.34	3513.73	330	300	245		71	100		2.0
10			Lost	Load								
11			↓	↓								
12												
Average		.0658	.452		332							

METER VOL. END
START 3488.34
SAMPLE VOL. 25.49 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	0.00" H₂O	29.63

Percent O₂ =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =
C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	116	-	100	=	16
#2	103	-	100	=	3
#3	0	-	0	=	0
				Total	19
#4	g(End)		g(Start)		Δgrams
Silica Gel	155.2	-	147.0	=	8.2

Total Vol. H₂O 27.2 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5.0

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

ISOKINETICS - 101.8

TEST NUMBER 9
DATE 8/29/78
OPERATOR RAC
FUEL Ohio
SITE D
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
#2 1	15:25	.01	.95	3099.15	340	250	290		81	89		7.5
2		.01	.95	3102.83	340	295	300		70	89		7.5
3		.005	.47	3105.44	325	305	310		70	90		4.8
4		0.00	—									
5		0.00	—									
6		0.00	—									
#3 1		.005	.47	3108.07	330	250	295		65	90		4.8
2		.005	.47	3110.63	335	290	295		68	90		4.8
3		.005	.47	3113.31	335	310	290		—	91		4.8
4		.005	.47	3115.85	335	310	290		70	91		4.8
5		.005	.47	3118.46	310	310	300		68	90		4.8
#4 1		.005	.47	3121.11	325	300	300		65	90		4.8
2		.005	.47	3123.66	325	300	300		68	90		4.8
3		.005	.47	3126.35	320	310	300		68	90		4.8
4		.005	.47	3128.90	320	315	300		70	90		4.8
5		.005	.47	3131.58	—	310	300		70	92		5.0
#5 1		0.00	—									
2		.005	.47	3134.31	—	300	270		72	97		4.8
#6 1		.005	.47	3136.90	325	280	270		70	93		4.8
2		.01	.95	3140.74	—	280	280		68	92		7.5
#7 1		.01	.95	3143.62	330	280	280		65	90		7.8
2		.01	.95	3148.47	—	275	275		68	91		7.8
Average		.006	.60		329							

METER VOL. END 3148.470
START 3095.400
SAMPLE VOL. 55.804 ft Corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	2.2" H_2O	29.52

Percent O_2 =

Meter corr. 1.0516

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal) =
Noz(Actual) = .749

φ - .020

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	142	-	100	=	42
#2	110	-	100	=	10
#3	1	-	0	=	1
				Total	53
#4 Silica Gel	g(End) 165	-	g(Start) 143	=	Δgrams 22
				Total Vol. H_2O	75 ml

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

Sampling Time Per Point, Min
5.0

ISOKINETICS 100.8%

TEST NUMBER 9
DATE 8/29/78
OPERATOR JD
FUEL Ohio
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
B 1		0.00										
2		.009	.11	3517.37	300	285	225		69	82		1.2
3		.01	.12	3518.80	300	280	240		50	84		1.2
4		.01	.12	3520.23	300	275	280		72	80		1.2
5		.02	.24	3522.17	300	265	300		72	81		2.0
6		.04	.50	3524.87	300	285	250		62	81		4.8
7		.05	.62	3527.82	300	290	285		61	80		5.2
8		.05	.62	3530.76	300	290	240		65	83		5.2
9		.05	.64	3533.69	300	290	270		61	80		5.2
10		.05	.62	3536.65	300	290	280		65	82		5.2
11		.05	.62	3539.76	300	290	270		62	89		5.2
12		.03	.37	3542.05	200	290	270		60	89		2.9
A 1		0.00										
2		0.00										
3		.03	.37	3544.35	300?	280	245	—	75	87		2.4
4		0.00										
5		.01	.12	3545.02	300?	300	285		61	90		1.2
6		.02	.24	3547.91	—	300	300		61	90		2.0
7		.04	.56	3550.53	—	310	310		60	91		4.8
8		.03	.37	3552.82	—	240	320		61	95		3.4
9		.03	.37	3555.08	—	315	315		61	97		3.4
10		.01	.12	3556.50	—	310	310		50	100		1.2
11		.01	.12	3557.87	—	310	310		65	98		1.2
12		.01	.12	3559.29	—	310	320		65	98		1.2
Average		.027	.348		300							

METER VOL. END
START 3515.94
SAMPLE VOL. 43.35 ft³

C pitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	0.00	29.52

Percent O₂ =

Nomograph Setup

P meter =
P stack =
T meter =
ΔH@ =
% H₂O =
C =
T stack =
ΔP =
Noz(Ideal) =
Noz(Actual) =

Imp.	Vol.(End)		Vol.(Start)		ΔVol.(ml)
#1	131	-	100	=	31
#2	105	-	100	=	5
#3	0	-	0	=	0
				Total	36
#4 Silica Gel	g(End) 754.9	-	g(Start) 743.3	=	Δgrams 11.6

Total Vol. H₂O 47.6 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
5.0

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS = 100.5

TEST NUMBER 10
DATE 5/30/78
OPERATOR RAP
FUEL Ohio
SITE D
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
#7 1		.03	2.2	3154.37	340	295	300		75	97		16.1
2		.02	1.45	3158.76	—	295	310		75	97		10.0
#6 1		.01	.73	3162.03	335	290	315		75	97		6.2
2		.01	.73	3165.32	335	295	315		72	97		6.2
#5 1		.01	.73	3168.51	325	280	300		70	98		6.2
2		.01	.73	3171.72	—	280	290		69	98		6.2
#4 1		.015	1.10	—	340	300	280		70	88		8.0
2		0.00										
3		.005	.37	3178.03	330	280	290		62	88		4.3
4		.005	.37	3180.40	335	275	290		62	88		4.5
5		.005	.37	3182.73	335	275	300		62	88		4.5
#3 1		.015	1.10	3186.76	340	240	380		68	88		8.5
2		.015	1.10	3190.76	355	250	285		62	88		8.3
3		.01	.73	3194.13	355	290	290		63	88		6.5
4		.01	.73	3197.44	355	300	300		62	88		6.5
5		.015	1.10	3201.43	345	300	300		61	86		8.8
#2 1		.025	1.85	3207.00	350	260	310		62	88		13.8
2		.025	1.85	3212.05	360	260	310		60	88		14.2
3		.015	1.10	3216.02	355	300	315		60	88		9.2
4		.015	1.10	3219.95	355	305	305		61	88		9.2
5		.02	1.45	3224.48	350	305	310		60	88		12.0
6		.01	.73	3227.808	—	305	310		61	86		7.5
Average		0.14	1.03		344							

METER VOL. END
START 3148. 840
SAMPLE VOL. 93.044 ft³ Corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	−.24" H_2O	29.65

Percent O_2 =

meter corr.- 1.0516

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
$\Delta H_@$ =
% H_2O =

C =
T_{stack} =
ΔP =
Mos(Ideal)=
Mos(Actual)= .691

Imp.	Vol.(End)		Vol.(Start)		ΔVol.(ml)
#1	170	-	100	=	70
#2	122	-	100	=	22
#3	2	-	0	=	2
				Total	94
#4	g(End)		g(Start)		Δgrams
Silica Gel	161	-	145	=	16

Total Vol. H_2O 110 ml

PARTICULATE

DATA

Sampling Time Per Point, min
5.0

Leak Check Rate

Vac in. Hg ft^3/min

Before

After

ISOKINETICS = 93 %

TEST NUMBER 10

DATE 8/30/79

OPERATOR JD

FUEL Ohio

SITE D

PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
A 1		0.00										
2		.01	.12	3562.69	300?	295	280		65	80		1.2
3		.01	.12	3564.22		300	300		60	80		1.2
4		.01	.12	3565.74		300	300		60	81		1.2
5		.02	.24	3567.71		305	310		60	80		1.6
6	54+	.03	.36	3570.19		310	320		59	82		2.0
7	24+	.10	1.2	3574.48		310	320		55	82		—
8		.08	1.0	358.14		310	315		61	70		6.0
9		.08	1.0	3581.78		310	315		61	70		6.0
10		.05	.60	3584.65		320	315		65	90		4.2
11		.05	.60	3587.49		320	315		65	92		4.2
12		.05	.60	3590.33		320	315		65	90		4.2
B 1		0.00										
2		.02	.24	3592.16		250	240		60	80		2.9
3		.03	.36	3594.43		280	260		55	90		3.2
4		.03	.36	3596.67		305	280		55	90		3.3
5		.04	.49	3599.25		309	295		55	90		4.0
6		.06	.73	3602.41		305	302		58	85		5.0
7	↑	.06	.73	3605.53		305	310		55	90		5.0
8		.05	.60	3608.46		290	305		55	90		4.5
9		.07	.85	3611.85		300	300		55	90		5.5
10		.05	.60	3614.73		298	290		58	90		4.5
11		.06	.73	3617.91		300	290		59	90		5.0
12		.05	.60	3620.74		300	290		59	90		4.5
Average		.045	.557		300							

METER VOL. END 3620.79

START 3561.15

SAMPLE VOL. 59.64 ft^3

C_{pitot}	Stack Press. in. Hg-Gauge	Barometric Pressure
.817	0.00	29.65

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

$\Delta H_@$ = Noz(Ideal)=

% H_2O = Noz(Actual)= .440

=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	153	-	100	=	53
#2	108	-	100	=	8
#3	0	-	0	=	0
				Total	61
#4	g(End)		g(Start)		Δgrams
Silica Gel	166.1	-	147.5	=	18.6

Total Vol. H_2O 79.6 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
3.0

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS = 101.4%

* Mano Change
.037

TEST NUMBER 12
DATE 9/6/78
OPERATOR RAP
FUEL Perfect 8
SITE D
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
#2 1	10:45	.04	1.95	3231.17	380	250	330		70	90		15.2
2		.03	1.40	3233.76	370	250	330		78	93		10.8
3		.02	.95	3235.97	365	320	320		65	95		8.0
4		.015	.71	3237.90	365	320	320		68	95		7.1
5		.015	.71	3239.79	365	325	315		68	95		7.1
6		.005	.24	3240.93	350	320	315		70	96		4.0
#3 1		.025	1.18	3243.45	370	250	300		70	96		10.1
2		.025	1.18	3245.82	375	250	300		69	96		10.1
3		.015	.71	3247.71	365	280	295		70	97		7.2
4		.02	.95	3249.90	375	290	290		70	97		8.8
5	*	.015	.71	3251.82	350	290	290		71	98		7.4
#4 1		.01	.49	3253.47	340	250	290		71	98		6.0
2		.01	.49	3255.07	360	265	300		70	98		6.0
3		.01	.49	3256.61	360	280	300		65	98		6.2
4		.015	.74	3258.56	365	290	290		65	98		7.8
5		.015	.74	3260.52	—	290	295		67	98		7.8
#5 1	13:22	.015	.74	3262.46	345	250	270		80	103		8.0
2		.01	.49	3264.03	—	280	270		70	103		6.2
#6 1		.025	1.23	3266.49	360	295	285		72	103		11.8
2		.01	.49	3268.07	355	305	300		70	103		6.3
#7 1		.035	1.75	3271.94	360	320	320		71	105		16.8
2		.025	1.23	3273.415	370	320	320		70	105		12.2
Average		.0175	.89		362							

METER VOL. END
START 3228.065
SAMPLE VOL. 42.69 ft³ Corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-3.2" H₂O	29.49

Percent O_2 =

Meter -Corr. -1.0516

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal) =
Noz(Actual) = .624

T = .039

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	157	-	100	=	57
#2	113	-	100	=	13
#3	1	-	0	=	1
				Total	71
#4	g(End)		g(Start)		Δgrams
Silica Gel	152.0	-	138.0	=	14
				Total Vol. H_2O	85 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
3.0

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS = 92.5

TEST NUMBER 12
DATE 9/6/78
OPERATOR SD
FUEL ohio
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
B 1		.07	.19	3622.94		270	230		75	80		1.8
2		.05	.32	3623.28		270	240		70	70		2.2
3		.05	.32	3624.54		290	245		69	84		2.2
4		.05	.32	3625.84		280	245		70	83		2.[illegible]
5		.06	.38	3627.26		220	245		70	85		2.5
6		.08	.52	3628.87		280	250		70	89		4.1
7		.08	.52	3630.49		280	250		75	90		4.1
8		.08	.52	3632.08		280	265		69	90		4.1
9		.06	.38	3633.47		280	275		70	90		2.5
10		.05	.32	3634.65		280	275		70	91		2.3
11		.05	.32	3635.87		240	265		69	95		2.3
12		.05	.32	3637.12		260	265		70	95		2.3
A 1		.02	.13	3638.00		200	225		80	90		1.2
2		.02	.13	3638.86		250	240		72	91		1.3
3		.02	.13	3639.72		270	240		70	90		1.2
4		.03	.19	3640.73		280	250		70	91		1.4
5		.03	.19	3641.72		280	250		70	93		1.4
6		.06	.38	3643.16		80	255		70	95		2.3
7		.10	.65	3644.92		285	255		70	97		4.5
9		.13	.85	3646.93		285	260		70	98		5.2
9		.13	.85	3648.93		280	265		70	99		5.2
10		.12	.75	3650.42		280	260		73	100		5.0
11		.12	.75	3652.70		280	260		72	100		5.0
12		.10	.65	3654.48	360	270	225		75	100		4.5
Average		.065	.42		360							

METER VOL. END 3654.48
START 3620.91
SAMPLE VOL. 33.57 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	0.00	29.49

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
$\Delta H_@$ =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	133	-	100	=	33
#2	107	-	100	=	7
#3	0	-	0	=	0
				Total	40

#4	g(End)		g(Start)		Δgrams
Silica Gel	159.6	-	146.6	=	13

Total Vol. H_2O 53 ml

DATA

Sampling Time Per Point, Min: 3.0

Leak Check Rate

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS - 102.9%

TEST NUMBER 13
DATE 9/7/78
OPERATOR RAP
FUEL Ohio
SITE D
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
7 1		.035	1.65	3276.97	350	320	250		72	85		14.8
2		.015	.71	3278.91	355	310	250		73	85		7.2
6 1		.025	1.20	3281.43	365	290	240		69	86		10.8
2		.02	.94	3283.61	—	290	295		70	87		9.3
5 1		.01	.47	3285.24	365	285	290		70	88		5.6
2		.005	.24	3286.42								
4 1	11:25	.01	.47	3287.87	355	285	260		79	70		6.2
2		.01	.47	3289.44	355	295	270		64	90		6.3
3		.015	.71	3291.28	355	300	280		65	90		8.3
4		.01	.47	3292.86	360	305	300		63	90		6.8
5		.005	.24	3294.00	330	300	290		66	91		4.8
3 1		.025	1.20	—	375	220	220		68	90		12.5
2		.02	.94	3298.63	380	300	275		68	91		11.0
3		.02	.94	3300.81	370	310	285		63	92		11.2
4		.02	.94	3302.02	370	315	300		62	95		11.2
5		.015	.71	3304.90	360	300	305		63	95		9.3
2 1		.025	1.20	3307.34	360	—	300		70	95		14.1
2		.025	1.20	3309.77	375	260	310		64	97		14.2
3		.015	.71	3311.64	370	275	315		65	97		9.6
4		.015	.71	3313.53	365	295	315		68	97		9.7
5		.015	.71	3315.45	370	300	315		68	98		9.8
6		.01	.47	3316.893	355	300	300		70	98		7.8
Average		.016	.786		362							

METER VOL. END 3316.893
START 3274.013
SAMPLE VOL. 45.887 ft³ Corr.

C_pitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.877	3.26 "H₂O	29.50

Percent O₂ =

Meter Corr. - 1.0516

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
$\Delta H_@$ =
% H_2O =
C =
T_{stack} =
ΔP =
Mos(Ideal) =
Mos(Actual) =

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	156	100	56
#2	112	100	12
#3	1	0	1
		Total	69
#4 Silica Gel	g(End) 144	g(Start) 137	Δgrams 7

Total Vol. H_2O 76 ml

PARTICULATE

DATA

Leak Check Rate

Vac
in. Hg ft^3/min

Sampling Time Per Point, Min
3.0

Before

After

ISOKINETICS = 89 %

TEST NUMBER 13
DATE 9/7/78
OPERATOR JD
FUEL Ohio
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Out	Meter	O_2,%	Vac.
A 1		0.00										
2		0.00										
3		0.00										
4		0.00										
5		0.00										
6		.03	.19	—	340	280	190		69	95		1.4
7		.08	.50	3660.20	340	295	210		70	98		3.0
8		.12	.75	3662.10	340	310	250		61	100		5.0
9		.15	.95	3664.20	340	320	280		60	100		6.0
10		.12	.75	3666.07	340	320	290		60	100		5.0
11		.12	.75	3667.94	340	320	300		60	105		5.0
12		.12	.75	3669.75	340	320	240		70	105		5.0
B 1		.03	.19	3670.73		200	295		90	110		1.6
2		.03	.19	3671.78		260	300		71	110		1.6
3		.05	.32	3673.01		300	300		70	110		2.2
4		.07	.45	3674.46		320	315		69	112		3.0
5		.07	.45	3675.90		290	310		65	115		3.0
6		.05	.32	3677.17		285	290		65	115		2.4
7		.05	.32	3678.41		300	295		65	117		2.4
8		.05	.32	3679.62		310	300		65	120		2.4
9		.05	.32	3680.89		310	300		67	120		2.5
10		.05	.32	3682.14		310	300		70	121		2.5
11		.05	.32	3683.25		315	290		69	121		2.5
12		.05	.32	3684.53		315	290		67	123		2.5
Average		.070	.446		340							

METER VOL. END 3684.53
START 3657.59
SAMPLE VOL. 26.94 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.847	0.0" H_2O	29.50

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_0 = Mos(Ideal)=
% H_2O = Mos(Actual)=
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
01	132	-	100	=	32
02	104	-	100	=	4
03	0	-	0	=	0
				Total	36
04	g(End)		g(Start)		Δgrams
Silica Gel	152.4	-	147.7	=	5.7
				Total Vol. H_2O	41.7 ml

DATA

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

Sampling Time Per Point, Min
3.0

ISOKINETICS = 99.1%

TEST NUMBER 14
DATE 9/11/78
OPERATOR RAP
FUEL Century
SITE D
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
2 1	11:40	.035	1.62	3320.05	370	270	315		80	97		13.5
2		.025	1.18	3322.48	365	300	310		85	97		10.2
3		.02	.93	3324.63	360	320	310		80	97		8.5
4		.015	.70	3326.55	360	315	310		80	97		6.8
5		.025	1.18	3328.99	360	310	310		75	97		10.0
6		.015	.70	3330.86	350	305	310		72	97		6.8
3 1		.02	.93	3333.12	370							
2		.025	1.18	3335.52	370	260	290		68	100		10.0
3		.02	.93	3337.70	365	285	290		69	100		8.7
4		.02	.93	3339.89	365	300	300		70	100		9.0
5		.015	.70	3341.71	365	300	290		70	100		7.3
4 1		.005	.23	3342.95	345	250	300		72	100		4.5
2		.005	.23	3344.12	350	270	305		71	100		4.5
3		.005	.23	3345.27	355	280	305		70	98		4.8
4		.01	.46	3346.74	360	290	300		70	98		6.0
5		.01	.46	3348.35	—	290	305		68	98		6.0
5 1		.005	.23	3349.45								
2		.01	.46	3350.96	—	310	270		70	98		5.8
6 1		.025	1.18	3353.54	360	310	270		68	97		11.3
2		.02	.93	3355.67	—	320	275		70	98		9.3
7 1		.04	1.85	3358.63	360	320	290		69	95		22.0
2		.025	1.18	3361.092	355	320	300		69	94		12.0
Average		.0179	.827		360							

METER VOL.	
END	
START	3317.209
SAMPLE VOL.	46.148 ft^3 Corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.877	-7.0 "H_2O	29.31

Percent O_2 =

Meter Corr. 1.0516

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal) =
Noz(Actual) = .624

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	154	-	100	=	54
#2	113	-	100	=	13
#3	1	-	0	=	1
				Total	68
#4	g(End)		g(Start)		Δgrams
Silica Gel	157	-	145.4	=	11.6
			Total Vol. H_2O		79.6 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
3.0

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 100.7%

TEST NUMBER 14
DATE 9/11/78
OPERATOR JD
FUEL Century
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
B1		0.00										
2		0.00										
3		.02	.21	3695.38	340?	290	260		72	92		2.0
4		.02	.21	3696.46		310	230		70	95		1.6
5		.02	.21	3697.53		305	270		65	95		1.6
6		.06	.42	3698.99		300	250		65	95		2.5
7		.09	.65	3700.75		290	265		69	99		4.5
8		.09	.65	3702.55		230	220		75	100		4.5
9		.05	.35	3703.88		290	240		75	100		2.0
10		.05	.35	3705.29		305	250		76	100		2.0
11		.02	.14	3706.14		305	250		70	100		2.0
12		.07	.50	3707.65		305	260		70	100		2.0
A 1		0.00										
2		.015	.105	est. 3708.45		190	170		75	95		1.0
Average		.0486	.345	14.15	340							

METER VOL. END
START 3694.30
SAMPLE VOL. ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817		29.21

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	127	-	100	=	27
#2	102	-	100	=	2
#3	0	-	0	=	0
				Total	29
#4 Silica Gel	g(End) 152.7	-	g(Start) 147.1	=	Δgrams 5.6
				Total Vol. H_2O	34.6 ml

DATA

Leak Check Rate

ISOKINETICS = 97.2

TEST NUMBER 15
DATE 9/12/78
OPERATOR RAP
FUEL Century
SITE D
PROBE LOCATION BLR OUT

Sampling Time Per Point, Min
3.0

	Vac in. Hg	ft³/min
Before		
After		

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
7 1		.035	1.63	3364.46	355	285	320		70	81		18.2
2	11:55	.025	1.17	3366.92	340	290	290		70	81		11.5
6 1	11.01	.025	1.17	3370.28	350	300	300		68	81		11.5
2		.02	.92	3372.51	—	300	300		68	81		7.6
5 1		.01	.46	3374.05	320	300	300		70	81		5.7
2		.02	.92	3376.34	—	290	290		60	80		9.2
2 1		.04	1.85	3379.40	365	230	230		61	80		22.0
2		.035	1.62	3382.34	365	285	260		60	80		17.4
3		.03	1.40	3385.03	360	310	280		61	80		13.6
4		.02	.92	3387.27	360	310	280		61	80		8.8
5		.025	1.17	3389.63	365	300	285		60	80		10.8
6		.01	.46	3391.26	340	300	290		60	80		5.7
3 1		.025	1.17	3393.66	—							
2		.03	1.40	3396.43	365	270	280		58	81		14.5
3	40	.025	1.17	3399.75	355	270	280		54	81		120
4		.025	1.17	3402.81	355	280	280		60	81		12.0
5		.015	.70	3404.25	340	285	285		60	81		7.8
4 1	3.25	.005	.225	3405.42	345	–	290		70	81		4.2
2		.01	.46	3406.94	350	260	300		61	82		—
3		.01	.46	3408.52	345	260	300		62	81		5.7
4		.01	.46	3410.14	345	270	300		62	81		5.7
5		.005	.23	3411.322	335	280	285		62	81		4.2
Average		.020	.961		350.2							

METER VOL. END
START 3361.506
SAMPLE VOL. 52.3 ft³ Corr.

C_pitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-3.2 "H₂O	29.55

Percent O₂ =

Meter Corr. 1.0516

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
$\Delta H_@$ = Nox(Ideal)=
% H_2O = Nox(Actual)= .624
= .04

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	150	-	100	=	50
#2	112	-	100	=	12
#3	0	-	0	=	0
				Total	62
#4	g(End)		g(Start)		Δgrams
Silica Gel	157	-	146.3	=	10.7
				Total Vol. H₂O	72.7 ml

PARTICULATE

DATA

Sampling Time Per Point, Min

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

ISOKINETICS = 98.0 %

TEST NUMBER 15
DATE 9/12/78
OPERATOR JD
FUEL Century
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
A 1		0.00										
2		.03	.21	3709.86	340	270	245		45	70		2.0
3		.03	.21	3710.92		285	220		45	70		2.0
4		.02	.14	3711.89		300	225		47	75		1.5
5		.04	.28	3713.15		300	260		49	75		2.2
6		.06	.42	3714.65		300	280		45	80		3.2
7		.10	.70	3716.55		305	275		47	80		5.5
8		.10	.70	3718.43		300	280		45	80		5.5
9		.12	.85	3720.49		300	290		48	80		6.7
10		.12	.85	3722.54		300	300		48	85		6.7
11		.08	.56	3724.24		300	300		50	88		5.0
12		.04	.28	3725.43		290	290		50	90		2.2
B 1	+30	.04	.28	3726.83		270	150		90	85		2.0
2		.04	.28	3728.06		280	165		50	89		2.0
3		.05	.35	3729.46		250	200		50	89		4.0
4		.06	.42	3730.96		—	200		50	90		4.2
5		.06	.42	3732.46		—	220		45	90		4.2
6		.07	.50	3734.09		—	220		45	90		5.0
7		.09	.64	3735.86		—	230		45	90		4.0
8	+15	.06	.42	3737.48		270	250		45	90		2.0
9		.04	.28	3738.61		—	275		50	90		2.0
10	+30	.04	.28	3740.—		270	280		50	90		2.8
11		.04	.28	3741.31		270	280		50	90		2.8
12		.02	.14	3742.22		270	270		50	90		1.7
Average		.0587	.413		340							

METER VOL. END
START 3708.65
SAMPLE VOL. 33.57 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817	—	29.55

Percent O$_2$ =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	134	-	100	=	34
#2	105	-	100	=	5
#3	0	-	0	=	0
				Total	39
#4	g(End)		g(Start)		Δgrams
Silica Gel	153.2	-	145.7	=	7.5

Total Vol. H_2O 46.5 ml

DATA

Leak Check Rate

Vac in. Hg ft^3/min

Sampling Time Per Point, Min

Before

After

ISOKINETICS = 104.1 %

TEST NUMBER 16
DATE 9/13/78
OPERATOR RAP
FUEL Century
SITE D
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
4 1		.01	.77	3413.80	322	320	250		70	72		6.8
2		.005	.39	3415.33	322	320	250		70	75		4.8
3		.005	.39	3416.92	320	315	270		70	75		—
4		.005	.39	3418.43	325	300	280		68	74		4.4
5		.005	.39	3419.85	—	290	290		63	75		4.8
3 1		.015	1.15	3422.39	330	250	275		60	75		9.2
2		.015	1.15	3424.81	340	270	280		58	75		9.3
3		.01	.77	3426.86	335	280	285		56	78		6.8
4		.015	1.15	3429.37	340	300	300		58	78		9.2
5		.015	1.15	3431.74	320	300	310		57	78		9.2
2 1		.03	2.3	3435.05	340	250	300		58	80		21.5
2		.03	2.3	3438.26	345	250	310		56	80		21.5
3		.02	1.50	3441.18	345	280	315		58	80		13.8
4		.02	1.50	3444.05	340	300	315		58	80		13.8
5		.02	1.50	3446.87	340	300	315		58	80		13.8
6		.01	.77	3448.972	—	300	315		57	80		7.5
5 1		.005	.39	3450.50	330	250	220		63	78		5.2
2		.005	.39	3451.96	—	275	270		60	78		5.0
6 1		.02	1.50	3455.02	330	320	270		58	75		12.5
2		.015	1.15	3457.49	330	310	275		59	75		9.5
7 1		.025	1.90	3460.71	340	310	280		59	75		—
2		.015	1.15	3463.273	—	310	240		60	75		9.7
Average		.014	1.08		333							

METER VOL. END
START 3411.722
SAMPLE VOL. 54.211 ft^3 Corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-2.4 "H_2O	29.57

Percent O_2 =

Meter Corr. – 1.0516

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)= .691
= .024

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	153	-	100	=	53
#2	112	-	100	=	12
#3	1	-	0	=	1
				Total	66
#4 Silica Gel	g(End) 164	-	g(Start) 157	=	Δgrams 7

Total Vol. H_2O 73 ml

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

Sampling Time Per Point, Min

ISOKINETICS = 95.1

TEST NUMBER 16
DATE 9/13/78
OPERATOR JD
FUEL Century
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$, %	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
A 1		0.00										
2		.03	.21	3751.29	310	210	290		50	80		1.7
3		.02	.14	3752.25	310	250	255		50	80		1.3
4		.04	.28	3753.43	310	275	360		50	80		2.0
5		.02	.14	3754.41	310	285	375		50	85		1.3
6		.06	.42	3755.88	310	290	280		50	85		3.
7		.06	.42	3757.35	310	300	290		50	90		4.0
8		.07	.48	3758.88	315	300	295		50	90		4.2
9		.06	.42	3760.35	310	300	300		50	90		4.0
10		.06	.42	3761.78	310	295	295		50	92		4.0
11		.05	.35	3763.12	310	300	300		50	95		3.5
12		.04	.28	3764.39	260	300	300		50	95		2.0
B 1		0.00										
2		0.00										
3		0.00										
4		.02	.14	3765.20	310	220	290		50	95		1.3
5		.03	.21	3766.27	310	265	300		50	95		2.0
6		.06	.42	3767.67	310	285	310		47	98		4.0
7		.10	.70	3769.61	310	295	320		45	96		5.8
8		.06	.42	3770.98	310	300	315		47	100		4.0
9		.06	.42	3772.41	310	300	305		47	100		4.0
10	+30 sec	.05	.35	3773.91	310	300	310		50	100		4.0
11		.06	.42	3775.32	310	300	310		50	100		3.5
12		.04	.28	3776.48	260	300	310		50	100		2.0
Average		.0495	.347		305							

METER VOL. END
START 3750.11
SAMPLE VOL. 26.35 ft^3

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.817		29.57

Percent O$_2$ =

Nomograph Setup

P$_{meter}$ =
P$_{stack}$ =
T$_{meter}$ =
ΔH$_@$ =
% H$_2$O =

C =
T$_{stack}$ =
ΔP =
Noz(Ideal) =
Noz(Actual) =

Imp.	Vol. (End)	Vol. (Start)	ΔVol. (ml)
#1	128	100	24
#2	103	100	3
#3	0	0	0
		Total	31
#4	g(End)	g(Start)	Δgrams
Silica Gel	153.2	146.8	6.5
		Total Vol. H$_2$O	37.5 ml

DATA

Leak Check Rate

Vac in. Hg ft^3/min

Sampling Time Per Point, Min

Before

After

ISOKINETICS = 101.7

TEST NUMBER 17
DATE 9/14/78
OPERATOR RAP
FUEL Century
SITE D
PROBE LOCATION BJR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers		Meter		
								In	Out			
7 1		.04	1.9	3466.51	360	285	300		70	78		20.0
2		.025	1.18	3469.10	345	285	295		80	78		9.7
6 1		.025	1.18	3471.57	330	275	300		70	78		7.3
2		.015	.71	3473.58	—	285	300		65	77		6.8
5 1		.005	.24	3474.76	340	270	300		68	77		4.2
2		.005	.24	3475.99	—	270	300		65	77		4.2
—	Leak Check			3476.202								
4 1		.005	.24	3477.38	350	285	250		70	82		4.8
2		.01	.47	3478.95	350	295	250		63	82		6.3
3		.01	.47	3480.52	350	300	250		62	82		63
4		.015	.71	3482.49	—	310	250		61	82		8.4
5		.005	.24	3483.69	355	310	270		62	88		5.0
3 1		.025	1.18	3486.24	365	250	260		70	88		9.8
2		.03	1.40	3488.85	360	280	280		62	88		11.5
3		.025	1.18	3491.34	360	300	300		62	88		9.8
4		.025	1.18	3493.71	365	310	305		62	89		9.8
5		.025	.94	3495.91	370	310	315		63	89		8.8
2 1		.035	1.65	3499.03	370	350	315		67	89		16.2
2		.025	1.18	3501.47	370	260	310		63	90		11.8
3		.02	.94	3503.61	365	295	310		65	90		9.5
4		.015	.71	3505.54	365	310	310		68	90		8.2
5		.02	.94	3507.72	365	320	310		6	90		10.0
6		.01	.47	3507.378	345	315	300		65	90		6.7
Average												

METER VOL. END
START 3462.479
SAMPLE VOL. 40.044 ft^3 Corr.

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-2.7" H_2O	29.25

Percent O_2 =

Meter Corr. 1.0516

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
$\Delta H_@$ =
% H_2O =

C =
T_{stack} =
ΔP =
Noz (Ideal) =
Noz (Actual) = .624

T = .04

Imp.	Vol. (End)		Vol. (Start)		ΔVol. (ml)
#1	130	-	100	=	30
#2	136	-	100	=	36
#3	1	-	0	=	1
				Total	67
#4	g (End)		g (Start)		Δgrams
Silica Gel	150	-	133	=	12

Total Vol. H_2O 79 ml

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

Sampling Time Per Point, Min
3.0

ISOKINETICS = 90.6 %

TEST NUMBER 7
DATE 9/14/78
OPERATOR SD
FUEL Century
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
A 1		0.00										
2		.03	.21	3782.79	300	215	210		60	80		1.8
3		.02	.14	3783.61	320	280	250		55	80		1.2
4		.02	.14	3789.52	330	280	255		55	90		1.2
5		.02	.14	3784.49	330	280	260		55	90		1.2
6		.03	.21	3786.51	325	280	250		55	90		1.8
7		.13	.91	3788.58	330	275	265		57	90		6.4
8		.11	.77	3790.47	325	280	270		52	92		5.0
9		.11	.77	3792.32	325	280	275		55	95		5.0
10		.12	.85	3794.35	325	282	260		55	97		5.5
11		.15	1.05	3796.52	325	280	205		55	98		6.8
12		.10	.70	3798.16	320	280	190		55	100		4.8
B 1		.02	.14	3799.25	320	150	220		65	100		1.2
2		.06	.42	3800.61	340	230	235		55	100		2.5
3		.06	.42	3802.03	340	260	240		50	100		2.5
4		.09	.64	3803.74	340	270	240		45	100		4.5
5	+16	.06	.42	3805.19	340	280	245		50	100		2.5
6		.09	.64	3805.45	360	275	250		55	100		4.5
7		.07	.49	3806.84	340	280	230		55	100		4.0
8		.05	.35	3808.12	340	280	240		60	100		2.3
9		.07	.49	3809.65	340	280	250		55	100		4.0
10		.03	.21	3810.58	340	270	220		60	105		1.5
11		.04	.20	3811.67	340	270	260		60	105		2.0
12		.03	.21	3812.66	340	270	280		60	105		1.8
				3813.85								
Average		.065	.461		331							

METER VOL. END
START 3781.71
SAMPLE VOL. 32.14 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817		29.25

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	138	-	100	=	38
#2	103	-	100	=	3
#3	0	-	0	=	0
				Total	41
#4	g(End)		g(Start)		Δgrams
Silica Gel	154.7	-	131.0	=	16.7

Total Vol. H_2O 57.7 ml

DATA

Leak Check Rate

Vac in. Hg ft^3/min

Sampling Time Per Point, Min

Before

After

ISOKINETICS = 93.1.

TEST NUMBER 18

DATE 9/15/79

OPERATOR RAP

FUEL Century

SITE D

PROBE LOCATION BCK OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O$_2$,%	Vac.
		ΔP$_s$	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
2 1	10:53	.035	1.65	3512.42	360	270	310		62	83		14.7
2		.035	1.65	3515.27	360	270	310		63	83		14.7
3		.025	1.18	3517.64	355	300	315		63	83		10.2
4		.02	.94	3519.82	355	315	315		62	83		9.8
5		.025	1.18	3522.32	355	320	315		60	85		10.2
6		.01	.47	3523.81	—	315	310		60	83		5.3
3 1		.02	.94	3526.03	345	250	260		70	85		7.8
2		.03	1.40	3528.65	360	285	260		61	85		11.0
3		.025	1.18	3531.14	355	315	260		61	94		10.2
4		.025	1.18	3533.59	355	310	260		61	85		10.0
5		.02	.94	3535.822	355	310	270		61	88		—
4 1		.005	.24	3536.99	340							
2		.01	.47	3538.58	340	260	275		62	88		5.5
3		.01	.47	3540.21	340	275	280		62	88		5.5
4		.01	.47	3541.70	345	240	240		65	89		5.5
5		.005	.24	3542.93	—	290	300		68	90		4.3
5 1		.01	.47	3544.50	345	250	250		68	95		5.3
2		.01	.47	3546.06	—	270	250		68	95		5.3
6 1		.035	1.65	3548.87	350	330	260		65	96		13.5
2		.025	1.18	3551.33	350	320	260		63	97		9.8
7 1		.04	1.90	3554.78	355	320	300		68	99		18.8
2		.025	118	3356.82	345	320	295		70	100		9.8
Average		.0207	.975		351							

METER VOL. END

START 3509.523

SAMPLE VOL. 47.242 ft^3 corr.

C$_{pitot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	−3.3" H$_2$O	29.46

Percent O$_2$ =

Meter corr 1.0516

Nomograph Setup

P$_{meter}$ =

P$_{stack}$ =

T$_{meter}$ =

ΔHg =

% H$_2$O =

C = .

T$_{stack}$ =

ΔP =

Noz(Ideal)=

Noz(Actual)= .624

= .04

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	144	-	100	=	49
#2	108	-	100	=	8
#3	1	-	0	=	1
				Total	58
#4	g(End)		g(Start)		Δgrams
Silica Gel	153.2	-	144.0	=	9.2
				Total Vol. H$_2$O	67.2 ml

PARTICULATE

DATA

Sampling Time Per Point, Min
3.0

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		*3824.85
After		*3825.85

ISOKINETICS = 90.2 %

TEST NUMBER 18
DATE 9/15/78
OPERATOR JD
FUEL Century
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
B 1		.02	.14	3820.98	310	270	200		62	90		1.2
2		.04	.28	3822.18	330	280	200		57	90		2.0
3		.04	.28	3823.38	330	290	240		50	90		2.0
* 4	+16 sec.	.04	.28	3824.61	330	290	260		56	90		2.0
* 5		.04	.28	3826.49	—	280	220		55	95		2.3
6		.05	.35	3827.74	340	280	220		55	94		4.0
7		.07	.50	3829.29	330	240	225		55	100		6.0
8		.12	.85	3831.30	335	290	290		45	100		5.0
9		.10	.70	3832.04	335	290	240		60	100		4.0
10		.07	.50	3834.54	335	290	290		60	105		5.0
11		.10	.70	3836.34	335	240	280		60	105		4.0
12		.05	.35	3837.57	330	290	220		55	105		2.0
A 1		0.00										
2		0.00										
3		0.00										
4		0.00										
5		.02	.14	3838.41	—	230	290		70	105		1.2
6		.06	.42	3839.79	—	220	290		60	105		3.5
7		.13	.91	3841.82	—	290	300		60	107		6.5
8		.13	.91	3843.84	—	300	300		60	107		6.5
9		.13	.91	3845.84	—	290	305		60	110		6.5
10		.09	.64	3847.56	—	295	310		60	110		4.5
11		.09	.64	3849.29	—	295	310		60	110		4.5
12		.07	.50	3850.81	—	295	315		60	110		4.0
Average		.073	.514		332							

METER VOL. END 3850.81
START 3820.98
SAMPLE VOL. 29.70 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817		29.46

Percent O_2 =

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =

C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	130	-	100	=	30
#2	104	-	100	=	4
#3	0	-	0	=	0
				Total	34
#4	g(End)		g(Start)		Δgrams
Silica Gel	156.3	-	147.1	=	9.2

Total Vol. H_2O 43.2 ml

DATA

Leak Check Rate

Sampling Time Per Point, Min

	Vac in. Hg	ft³/min
Before		
After		

ISOKINETICS -100.8

TEST NUMBER 23
DATE 9/22/78
OPERATOR RAP
FUEL Victoria
SITE D
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O₂, %	Vac.
		ΔPs	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
7 1		.03	1.40	3559.66	330	300	275		80	70		15.1
2		.015	.71	3561.62	325	300	285		68	70		7.5
6 1		.025	1.18	3564.11	310	300	275		62	70		23.3
2		.015	.71	3566.08	—	300	285		62	70		10.1
5 1		.01	.47	3567.62	315	300	300		65	72		6.8
2		.01	.47	3569.35	—	300	300		62	72		7.2
4 1		.01	.47	3570.58	320	250	260		61	72		5.2
2		.005	.24	3572.12	325	240	225		62	72		4.1
3		.01	.47	3573.68	320	290	280		62	73		5.2
4		.01	.47	3575.33	325	300	295		60	73		5.2
5		.01	.47	3576.88	—	300	200		60	75		5.2
3 1		.025	1.18	3579.38	340	240	290		60	77		9.0
2		.015	.71	3581.33	335	275	290		61	76		8.5
3		.015	.71	3583.30	325	240	290		61	77		8.7
4		.015	.71	3585.26								
5		.02	.94	3587.47	330	300	305		61	78		11.5
2 1		.03	1.4	3589.92	340	250	300		62	78		23.0
2		.025	1.20	3592.49	345	250	305		62	78		21.2
3		.025	1.20	3594.90	350	240	300		62	79		23.0
4		.02	.94	3597.22	345	240	310		63	79		14.3
5		.02	.94	3599.48	340	300	310		63	79		14.3
6		.01	.47	3601.012	—	300	310		65	79		6.5
Average		.0168	.79		330							

METER VOL. END
START
SAMPLE VOL. 46.861 ft³ Corr.

Cpitot	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-2.4" H₂O	30.04

Percent O₂ =

Nomograph Setup

Pmeter =
Pstack =
Tmeter =
ΔHg =
% H₂O =

C =
Tstack =
ΔP =
Noz(Ideal)=
Noz(Actual)=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	134	-	100	=	34
#2	112	-	100	=	12
#3	1	-	0	=	1
				Total	47
#4	g(End)		g(Start)		Δgrams
Silica Gel	149	-	139	=	10
				Total Vol. H₂O	57 ml

Meter corr. 1.0516

PARTICULATE

DATA

Leak Check Rate

	Vac in. Hg	ft^3/min
Before		
After		

Sampling Time Per Point, Min
3.0

ISOKINETICS = ______ %

TEST NUMBER 23
DATE 9/22/78
OPERATOR JD
FUEL Victoria
SITE D
PROBE LOCATION Stack

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2,%	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
A 1		0.00										
2		0.00										
3		0.00										
4		.014	.10	3860.12	325	180	180		50	70		0.9
5		.015	.105	3860.99	305	258	200		50	70		1.0
6		.04	.28	3862.28	305	280	220		51	70		1.5
7		.06	.42	3863.76	305	300	250		55	72		2.0
8		.07	.49	3865.37	305	310	280		59	75		2.3
9		.06	.42	3866.84	305	310	280		60	78		2.0
10		.07	.49	3868.40	305	310	290		65	81		2.3
11		.03	.21	3869.51	310	310	300		63	83		1.3
12		.03	.21	3870.59	240	310	305		68	85		1.3
B 1		0.00										
2		0.00										
3		.02	.14	3871.49	320	260	310		60	92		1.0
4		.02	.14	3872.37	320	290	310		68	95		1.0
5		.02	.14	3873.27	310	300	300		50	98		1.0
6		.04	.28	3874.35	310	300	290		65	98		1.3
7		.05	.35	3875.62	310	300	300		62	100		2.0
8		.05	.35	3876.69	310	300	295		65	100		2.0
9		.05	.35	3878.19	310	300	295		67	100		1.0
10		.06	.42	3879.52	310	300	300		65	103		2.2
11		.04	.28	3880.62	310	300	300		62	105		1.4
12		.09	.64	3882.36	310	310	305		70	107		4.0
Average												

METER VOL. END 3859.29
START 3882.36
SAMPLE VOL. ______ ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.817		30.09

Percent O_2 = ______

Nomograph Setup

P_{meter} =
P_{stack} =
T_{meter} =
ΔH_g =
% H_2O =
C =
T_{stack} =
ΔP =
Noz(Ideal)=
Noz(Actual)=
=

Imp.	Vol.(End)		Vol. (Start)		ΔVol.(ml)
#1	120	-	100	=	20
#2	104	-	100	=	4
#3	0	-	0	=	0
				Total	24
#4	g(End)		g(Start)		Δgrams
Silica Gel	157.0	-	149.0	=	8

Total Vol. H_2O 32 ml

PARTICULATE LAB WORKSHEET

TEST NO. 3 MECH (Inlet, Outlet) LOCATION Site D

Date ____ Box No. ____ Eng. ____

Test Description ____

Dry Gas Meter Vol (ft^3)

Final ____

Initial ____

Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			54	6	4		
DATE WT.			—	—	—		
TARE WT.	1		104.3563	50.4374	.8371		
	2		104.3558	50.4380	.8370		
	3		104.3556	50.4378	.8371		
	4		—	—	—		
AVG.			104.3559	50.4377	.8371		

POST TEST WTS.

	1		104.6941	50.4999	1.3714		
	2		104.6955	50.5003	1.3660		
	3		104.6954	50.4998	1.3668		
	4		—	—	—		
AVG.			104.6950	50.5000	1.3681		
Δ WT.			.3391	.0623	.5310		

Δ Vlc = ____ ml LOAD ____ klb/hr

Δ DgV = ____ ft^3 O_2 ____ %

Δ Mn 932.4 mgm REMARKS: ____

PARTICULATE LAB WORKSHEET

TEST NO. 4 BLR out (Inlet, Outlet) LOCATION side D

Date ________ Box No. ________ Eng. ________

Test Description ________

Dry Gas Meter Vol (ft^3)

Final ________

Initial ________

Δ DgV ________

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			3	8	5		
DATE WT.			—	—	—		
TARE WT.	1		95.9811	49.6428	.7491		
	2		95.9811	49.6424	.7491		
	3		95.9812	49.6422	—		
	4		—	—	—		
AVG.			95.9811	49.6425	.7491		
POST TEST WTS.							
	1		96.0782	50.0840	.9922		
	2		96.0781	50.0841	.9913		
	3		96.0779	50.0841	.9925		
	4		—	—	—		
AVG.			96.0781	50.0841	.9920		
Δ WT.			0.097	0.4416	.2429		

Δ Vlc = ________ ml LOAD ________ klb/hr

Δ DgV = ________ ft^3 O_2 ________ %

Δ Mn 781.5 mgm REMARKS: ________

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 4 MECH (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			4		6		
DATE WT.			—		—		
TARE WT.	1		95.6507		.8470		
	2		95.6510		.8471		
	3		95.6513		.8471		
	4		—		—		
AVG.			95.6510		.8471		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		95.8667		.9973		
	2		95.8664		.9954		
	3		95.8667		.9962		
	4		—				
AVG.			95.8666		.9963		
Δ WT.			0.2156		0.1492		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 364.8 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

BLR out

TEST NO. 5 (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			7	12	7		
DATE WT.			—	—	—		
TARE WT.	1		97.0291	50.3065	.7348		
	2		97.0288	50.3073	.7348		
	3		97.0288	50.3078	—		
	4		—	—	—		
AVG.			97.0289	50.3072	.7348		

POST TEST WTS.

	1		97.1897	51.2387	1.1413		
	2		97.1897	51.2390	1.1391		
	3		97.1893	51.2389	1.1395		
	4		—	—	—		
AVG.			97.1896	51.2389	1.1400		
Δ WT.			0.1607	0.9317	0.4052		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 1497.6 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 5 MECH (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			11	13	8		
DATE WT.			—	—	—		
TARE WT.	1		102.1512	50.3281	.8377		
	2		102.1513	50.3286	.8384		
	3		102.1518	50.3291	.8382		
	4		—	—	—		
AVG.			102.1514	50.3286	.8381		

POST TEST WTS.

1		102.5569	50.4692	1.3195		
2		102.5573	50.4689	1.3178		
3		102.5574	50.4691	~~1.3205~~		
4		—	—			
AVG.		102.5572	50.4091	1.3187		
Δ WT.		0.4058	0.1405	0.4806		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 1026.9 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 6 BLR OUT (Inlet, Outlet)
LOCATION 5. ſe D
Date
Box No.
Eng.
Test Description

Dry Gas Meter Vol (ft^3)
Final
Initial
Δ DgV

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			1	15	9		
DATE WT.			—	—	8-18-78		
TARE WT.	1		67.8401	50.2978	.7358		
	2		67.8397	50.2980	.7358		
	3		67.8395	50.2986	—		
	4		—	—	—		
AVG.			67.8398	50.2981	.7358		

POST TEST WTS.

	1		67.9451	51.3545	1.0726		
	2		67.9451	51.3547	1.0710		
	3		67.9451	51.3543	1.0726		
	4		—	—	—		
AVG.			67.9451	57.3545	1.0721		
Δ WT.			0.1053	1.0564	.03363		

Δ Vlc = ml
Δ DgV = ft^3
Δ Mn 1498.0 mgm
LOAD klb/hr
O_2 %
REMARKS:

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 6 MECH (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H$_2$O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.					—		
BEAKER NO.			2		10		
DATE WT.			—		8-18-78		
TARE WT.	1		63.5535		.7412		
	2		63.5527		.7412		
	3		63.5528		—		
	4		—		—		
AVG.			63.5530		.7412		

POST TEST WTS.

		H$_2$O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		63.6779		.9125		
	2		63.6774		.9110		
	3		63.6773		.9105		
	4		—		—		
AVG.			63.6775		.9113		
Δ WT.			0.1245		0.1701		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O$_2$ ______ %

Δ Mn 294.6 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

BLR OUT

TEST NO. 7 (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			5	14	11		
DATE WT.			—	—	—		
TARE WT.	1		64.0646	64.5845	.7323		
	2		64.0642	64.5845	.7327		
	3		64.0639	64.5846	.7327		
	4		—	—	—		
AVG.			64.0642	64.5845	.7326		
POST TEST WTS.							
	1		64.2162	65.9819	1.0103		
	2		64.2157	65.9822	1.0089		
	3		64.2156	65.9823	1.0097		
	4		—	—	—		
AVG.			64.2158	64.9821	1.0096		
Δ WT.			0.1516	1.3976	0.277		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 1826.2 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 7 MECH (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			10		12		
DATE WT.			—		—		
TARE WT.	1		69.0090		.7450		
	2		69.0088		.7452		
	3		69.0087		.7451		
	4		—		—		
AVG.			69.0088		.7451		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		69.1785		.8771		
	2		69.1778		.8764		
	3		69.1776		.8767		
	4		—		—		
AVG.			69.1780		.8767		
Δ WT.			.1692		0.1316		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn 300.8 mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 8 BLR OUT (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—	—	
BEAKER NO.			16	9	13	15	
DATE WT.			8-31-78	—	—	—	
TARE WT.	1		95.9815	69.5631	[redacted] .7292	.6100	
	2		95.9818	69.5630	.7295	.6101	
	3		95.9817	69.5632	.7294	.6102	
	4		—	—	—	—	
AVG.			95.9816	69.5631	.7294	.6101	

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		96.1203	70.7162	.8928	.8254	
	2		96.1205	70.7164	.8904	.8250	
	3		96.1190	70.7163	.8905	.8249	
	4		—	—	—	—	
AVG.			96.1199	70.7163	.8912	.8251	
Δ WT.			0.1383	1.1532	.1618	.2150	

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn [redacted] mgm REMARKS: ______

1668.3

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 8 MECH (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)
Final ______
Initial ______
Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			17		14		
DATE WT.			8-31-78		—		
TARE WT.	1		102.1515		.[illegible].7977		
	2		102.1515		.7978		
	3		102.1515		.7978		
	4		—		—		
AVG.			102.1515		.7978		

POST TEST WTS.

	1		102.2624		.8809		
	2		102.2619		.8806		
	3		102.2616		.8806		
	4		—		—		
AVG.			102.2619		.8807		
Δ WT.			0.1104		.0829		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn [illegible] mgm REMARKS: ______

193.3

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 9 BLR out (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			19	18	18		
DATE WT.			8-31-78	—	—		
TARE WT.	1		97.0289	95.6514	.6738		
	2		97.0292	95.6518	.6739		
	3		97.0289	95.6516	—		
	4		—	—	—		
AVG.			97.0290	95.6516	.6738		

POST TEST WTS.

	1		97.2560	95.9594	.~~9405~~		
	2		97.2564	95.9589	.9222		
	3		97.2561	95.9590	.9238		
	4		—	—	—		
AVG.			97.2562	95.9591	.9930		
Δ WT.			.2272	.3075	.3192		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 853.9 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 9 MECH (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			23		17		
DATE WT.			8-31-78		—		
TARE WT.	1		64.0650		.8406		
	2		64.0650		.8406		
	3		64.0650		.8407		
	4		—		—		
AVG.			64.0650		.8406		

POST TEST WTS.

	1		~~64.3047~~		.9814		
	2		64.3061		.9816		
	3		64.3061		.9817		
	4		—		—		
AVG.			64.3061		.9816		
Δ WT.			0.2411		0.1410		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 382.1 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

BLR OUT
TEST NO. 10 (Inlet, Outlet) LOCATION Site D
Date 8-30-78 Box No.______ Eng. ______
Test Description______

Dry Gas Meter Vol (ft^3)
Final______
Initial______
Δ DgV______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			26	20	19		
DATE WT.			8-31-78	8-31-78	—		
TARE WT.	1		63.5538	50.3286	.6740		
	2		63.5538	50.3286	.6742		
	3		63.5538	50.3287	.6742		
	4		—	—	—		
AVG.			63.5538	50.3286	.6741		

POST TEST WTS.

	1		63.7167	51.2967	~~.9867~~		
	2		63.7167	51.2967	.9714		
	3		63.7167	51.296[illegible]	.9712		
	4		—	—	—		
AVG.			63.7167	51.2966	.9713		
Δ WT.			.1629	.9680	.2972		

Δ Vlc = ______ ml LOAD______ klb/hr
Δ DgV = ______ ft^3 O_2______ %
Δ Mn ~~[illegible]~~ mgm REMARKS:______
1428.1

PARTICULATE LAB WORKSHEET

TEST NO. 10 MECH (Inlet, Outlet) LOCATION Side D

Date ____ Box No. ____ Eng. ____

Test Description ____

Dry Gas Meter Vol (ft^3)

Final ____

Initial ____

Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H$_2$O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			28	21	20		
DATE WT.			8-31-78	8-31-78	—		
TARE WT.	1		64.5844	50.3062	.8433		
	2		64.5846	50.3064	.8432		
	3		64.5843	50.3065	.8432		
	4		—	—	—		
AVG.			64.5847	50.3064	.8432		

POST TEST WTS.

	1		64.7771	50.3570	~~1.0930~~		
	2		64.7771	50.3573	1.0855		
	3		64.7768	50.3570	1.0852		
	4		—	—	—		
AVG.			64.7770	50.3571	1.0854		
Δ WT.			0.1923	0.0507	.2422		

Δ Vlc = ____ ml LOAD ____ klb/hr

Δ DgV = ____ ft^3 O$_2$ ____ %

Δ Mn 485.2 mgm REMARKS: ____

PARTICULATE LAB WORKSHEET

TEST NO. 12 (~~Inlet, Out~~BLR outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			31	24	21		
DATE WT.			9-14-78	9-7-78	9-1-78		
TARE WT.	1		97.0317	50.4385	.6669		
	2		97.0306	50.4380	.6670		
	3		97.0310	50.4382	.6670		
	4		97.0308	—	—		
AVG.			97.0310	50.4382	.6670		

POST TEST WTS.

1		~~97.2164~~	51.3762	.9981		
2		97.2143	51.3748	.9980		
3		97.2143	51.3748	.9982		
4		—	—	—		
AVG.		97.2143	51.3753	.9981		
Δ WT.		.1833	.9371	.3311		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 1451.5 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 12 MECH (~~Inlet, Outlet~~) LOCATION Site D

Date ____ Box No. ____ Eng. ____

Test Description ____

Dry Gas Meter Vol (ft^3)
Final ____
Initial ____
Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			32		22		
DATE WT.			9-14-78		9-1-78		
TARE WT.	1		~~95.9843~~		.8597		
	2		95.9831		.8601		
	3		95.9831				
	4		95.9828				
AVG.			95.9830		.8599		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		~~96.3218~~		~~1.1098~~		
	2		96.3185		~~1.1020~~		
	3		96.3190		1.1000		
	4		—		—		
AVG.			96.3187				
Δ WT.			.3357		.2401		

Δ Vlc = ____ ml LOAD ____ klb/hr

Δ DgV = ____ ft^3 O_2 ____ %

Δ Mn 575.8 mgm REMARKS: ____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 13 BLR OUT (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			33	27	23		
DATE WT.			9-14-78	—	9-7		
TARE WT.	1		63.5550	50.3003	.5891		
	2		63.5543	50.2998	.5891		
	3		63.5542	50.2997	.5892		
	4		63.5543	—			
AVG.			63.5545	50.2999	.5891		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		~~63.6912~~	51.0027	~~.8993~~		
	2		63.6697	51.0020	~~.8922~~		
	3		63.6694	51.0021	.8901		
	4		—	—	—		
AVG.			63.6695	51.0023	.8901		
Δ WT.			.1150	.7024	.3010		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 1118.4 mgm REMARKS: ______

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 13 -MECH (~~Inlet, Outlet~~) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			34		24		
DATE WT.			9-14-78		9-7		
TARE WT.	1		102.1543		.7908		
	2		102.1534		.7928		
	3		102.1538		.7928		
	4		102.1530		—		
AVG.			102.1536		.7921		

POST TEST WTS.

		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
	1		~~102.3153~~		~~.9993~~		
	2		102.3142		.9959		
	3		102.3144		.9957		
	4		—		—		
AVG.			102.3143		.9958		
Δ WT.			.1607		.2037		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 364.4 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 14 BLR out (~~Inlet, Outle~~t) LOCATION Side D

Date Box No. Eng.

Test Description

Dry Gas Meter Vol (ft^3)

Final

Initial

Δ DgV

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—			
BEAKER NO.			35	22	25		
DATE WT.			9-14-78	—	9-7-78		
TARE WT.	1		64.5837	69.0092	.6018		
	2		64.5839	69.0096	.6018		
	3		64.5839	69.0091	.6019		
	4		—	—	—		
AVG.			64.5838	69.0093	.6018		

POST TEST WTS.

	1		64.6911	70.4617	~~.8584~~		
	2		64.6902	70.4613	.8486		
	3		64.6906	70.4612	.8487		
	4		—	—	—		
AVG.			64.6906	90.4614	.8486		
Δ WT.			.1068	1.4521	.2468		

Δ Vlc = ml

Δ DgV = ft^3

Δ Mn 1805.7 mgm

LOAD klb/hr

O_2 %

REMARKS:

PARTICULATE LAB WORKSHEET

TEST NO. 14 MECH (~~Inlet, Outlet~~) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			39		26		
DATE WT.			—		9-7-78		
TARE WT.	1		69.5635		.7369		
	2		69.5635		.7371		
	3		69.5629		.7370		
	4		—		—		
AVG.			69.5633		.7370		

POST TEST WTS.

	1		69.7517		~~.8474~~		
	2		69.7520		~~.8459~~		
	3		69.7520		.8443		
	4		—		—		
AVG.			69.7519		.8443		
Δ WT.			0.1886		.1073		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn 295.9 mgm REMARKS: ______

PARTICULATE LAB WORKSHEET

TEST NO. 15 MECH (~~Inlet, Outlet~~) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.							
BEAKER NO.			43	25	28		
DATE WT.			—	—	—		
TARE WT.	1		63.5531	49.6426	.7936		
	2		63.5531	49.6422	.7936		
	3		63.5525	49.6425	.7936		
	4		—	—	—		
AVG.			63.5529	49.6424	.7936		

POST TEST WTS.

	1		63.7497	49.6773	.9506		
	2		63.7505	49.6770	.9487		
	3		63.7504	49.6772	.9457		
	4		—	—	—		
AVG.			63.7502	49.6772	.9457		
Δ WT.			.1973	.0348	.1521		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn ______ mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: mg – 384.2

PARTICULATE LAB WORKSHEET

TEST NO. 15-BLR out ~~(Inlet, Outlet)~~ LOCATION Site D

Date ________ Box No. ________ Eng. ________

Test Description ________

Dry Gas Meter Vol (ft^3)

Final ________

Initial ________

Δ DgV ________

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			41	29	27		
DATE WT.			—	—	—		
TARE WT.	1		95.6521	67.8398	.6419		
	2		95.6515	67.8396	.6420		
	3		95.6505	67.8397	.6420		
	4		—	—	—		
AVG.			95.6514	67.8397	.6420		

POST TEST WTS.

	1		95.7031	~~69.1132~~	.8450		
	2		95.7041	69.1121	.8378		
	3		95.7038	69.1115	.8362		
	4		—	—	—		
AVG.			95.7037	69.1115	.8362		
Δ WT.			.0523	1.2718	.1942		

Δ Vlc = ________ ml LOAD ________ klb/hr

Δ DgV = ________ ft^3 O_2 ________ %

Δ Mn ________ mgm REMARKS: mg - 1518.3

PARTICULATE LAB WORKSHEET

TEST NO. 16 - BLRout ~~(Inlet, Outlet)~~

LOCATION Site D

Date

Box No.

Eng.

Test Description

Dry Gas Meter Vol (ft^3)

Final

Initial

Δ DgV

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			44	30	29		
DATE WT.			—	—	—		
TARE WT.	1		102.1511	64.0647	.5942		
	2		102.1507	64.0650	.5942		
	3		102.1499	64.0649	.5943		
	4		—	—	—		
AVG.			102.1505	64.0648	.5942		

POST TEST WTS.

	1		102.2398	64.9958	.7587		
	2		102.2411	64.9958	.7542		
	3		102.2410	64.9958	.7521		
	4		—	—	—		
AVG.			102.2406	64.9958	.7521		
Δ WT.			.0901	.9310	.1579		

Δ Vlc = ml

Δ DgV = ft^3

Δ Mn mgm

LOAD klb/hr

O_2 %

REMARKS: mg - 1179.0

PARTICULATE LAB WORKSHEET

TEST NO. 16 MECH (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			415	—	30		
DATE WT.			—	—	—		
TARE WT.	1		95.5757	—	.7973		
	2		95.5755	—	.7974		
	3		95.5747	—	.7974		
	4		—	—	—		
AVG.			95.5753	—	.7974		

POST TEST WTS.

	1		95.6813	—	.9043		
	2		95.6822	—	.9032		
	3		95.6818	—	.9025		
	4		—	—	—		
AVG.			95.6818	—	.9025		
Δ WT.			.1065	—	.1051		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn ______ mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: mg - 211.6

PARTICULATE LAB WORKSHEET

TEST NO. 17 BLR out (~~Inlet, Outlet~~) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			416	36	31		
DATE WT.			—	—	—		
TARE WT.	1		97.0288	50.2996	.6356		
	2		97.0282	50.2996	.6359		
	3		97.0279	50.2997	.6358		
	4		—	—	—		
AVG.			97.0283	50.2996	.6357		

POST TEST WTS.

	1		97.1346	51.5549	.8071		
	2		97.1401	51.5539	.8049		
	3		97.1400	51.5542	.8044		
	4		—	—	—		
AVG.			97.1399	51.5543	.8044		
Δ WT.			.1116	1.2547	.1687		

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn ______ mgm REMARKS: mg – 1535.0

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 17 MECH (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H$_2$O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			47	37	32		
DATE WT.			—	—	—		
TARE WT.	1		95.9813	50.3288	.7396		
	2		95.9811	50.3286	.7399		
	3		95.9804	50.3285	.7399		
	4		—	—	—		
AVG.			95.9809	50.3286	.7398		
POST TEST WTS.							
	1		96.1584	50.3740	.8785		
	2		96.1588	50.3737	.8779		
	3		96.1589	50.3734	.8764		
	4		—	—	—		
AVG.			96.1587	50.3737	.8764		
Δ WT.			.1778	.0451	.1366		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn ______ mgm

LOAD ______ klb/hr

O$_2$ ______ %

REMARKS: mg – 359.5

PARTICULATE LAB WORKSHEET

TEST NO. 18 BLRout (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			52	38	33		
DATE WT.			—	—	—		
TARE WT.	1		67.8397	50.3074	.5996		
	2		67.8398	50.3072	.5998		
	3		67.8393	50.3073	.5998		
	4		—	—	—		
AVG.			67.8396	50.3073	.5997		
POST TEST WTS.							
	1		67.9108	51.3728	.7603		
	2		67.9114	51.3722	.7551		
	3		67.9110	51.3719	.7552		
	4		—	—	—		
AVG.			67.9111	51.3723	.7552		
Δ WT.			.0715	1.0650	.1555		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn ______ mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: mg – 1292.0

PARTICULATE LAB WORKSHEET

TEST NO. 18 MECH (~~Inlet, Outlet~~)   LOCATION Site D

Date ____   Box No. ____   Eng. ____

Test Description ____

Dry Gas Meter Vol (ft^3)

Final ____

Initial ____

Δ DgV ____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			48	40	34		
DATE WT.			—	—	—		
TARE WT.	1		64.0660	50.4398	.7925		
	2		64.0652	50.4396	.7926		
	3		64.0657	50.4397	.7926		
	4		—	—	—		
AVG.			64.0656	50.4397	.7926		
POST TEST WTS.							
	1		64.2208	50.4936	.9193		
	2		64.2214	50.4929	.9175		
	3		64.2210	50.4927	.9176		
	4		—	—	—		
AVG.			64.2211	50.4927	.9176		
Δ WT.			.1555	.0530	.1250		

Δ Vlc = ____ ml   LOAD ____ klb/hr

Δ DgV = ____ ft^3 O_2 ____ %

Δ Mn ____ mgm   REMARKS: mg - 333.5

PARTICULATE LAB WORKSHEET

TEST NO. 23 BLR (Inlet, Outlet) LOCATION Site D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			50	49	35		
DATE WT.			—	—	—		
TARE WT.	1		69.0085	49.6427	.6683		
	2		69.0081	49.6422	.6682		
	3		69.0087	49.6420	.6682		
	4		—	—	—		
AVG.			69.0084	49.6423	.6682		

POST TEST WTS.

	1		69.1039	50.2396	.8192		
	2		69.1040	50.2401	.8193		
	3		69.1041	50.2400	.8198		
	4		—	—	—		
AVG.			69.1040	50.2399	.8194		
Δ WT.			.0956	.5976	.1512		

Δ Vlc = ______ ml

Δ DgV = ______ ft^3

Δ Mn ______ mgm

LOAD ______ klb/hr

O_2 ______ %

REMARKS: mg – 844.4

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 23 MECH (~~Inlet, Outlet~~) LOCATION Site D

Date ________ Box No. ________ Eng. ________

Test Description ________

Dry Gas Meter Vol (ft^3)

Final ________

Initial ________

Δ DgV ________

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—		—		
BEAKER NO.			51		36		
DATE WT.			—		—		
TARE WT.	1		64.5840		.8443		
	2		64.5837		.8440		
	3		64.5836		.8440		
	4		—		—		
AVG.			64.5837		.8441		
POST TEST WTS.							
	1		64.7945		.9413		
	2		64.7968		.9415		
	3		64.7952		.9410		
	4		—		—		
AVG.			64.7955		.9412		
Δ WT.			.2118		.0971		

Δ Vlc = ________ ml

Δ DgV = ________ ft^3

Δ Mn ________ mgm

LOAD ________ klb/hr

O_2 ________ %

REMARKS: mg – 308.9

SECTION 3.0

GASEOUS DATA

PAGE

3.1 GASEOUS EMISSION SUMMARY 121

3.2 GASEOUS EMISSION DATA SHEETS 123

3.3 NOx DATA 144

3.4 SOx DATA SHEETS 146

GASEOUS EMISSION SUMMARY

Location: ABMA Site D

Fuel: Ohio Coal

TEST NO.	DATE	LOAD %	CONDITIONS	Boiler Outlet O2 % Dry	Boiler Outlet CO2 % Dry	Boiler Outlet CO ppm Dry	Boiler Outlet NO ppm Dry	Boiler Outlet NO2 ppm Wet	Boiler Outlet HC ppm Wet	Stack O2 % Dry	Stack CO2 % Dry	Stack CO ppm Dry	Stack NO ppm Dry	SO2 ppm Dry	SO3 ppm Dry	NOTES
02	7-28-78	73	norm O2, low OFA	9.0	10.2	005	206			12.0	7.4	005	201			PART - STACK
03	8-3-78	69	norm O2, 10" OFA	10.1	9.3	108	225		16	10.6	8.7	66	213			PART - STACK
04	8-15-78	64	low O2, 10" OFA	93	98	24	235			10.0	9.3	19	230			PART - BLR + STACK
05	8-16-78	86	norm O2 10" OFA	7.9	11.2	89	222			8.4	108	148				↓
06	8-18-78	65	norm O2, 5" OFA	87	10.9	87	184	1		98	10.0	73	189			
07	8-22-78	63	norm O2, 15" OFA	10.2	9.9	29	255	-6		10.9	9.4	30	245			
08	8-23-78	66	med O2, 10" OFA	9.7	10.0	57	226	-7		10.5	95	62	214			
09	8-29-78	45	norm O2, 10" OFA	115	85	56	262	0		12.2	79	44	254			
10	8-30-78	63	high O2, 10" OFA	9.9	10.3	61	233			10.5	9.4	76	255			
11A	8-31-78	52	vary OFA 10" OFA	11.3	85	65	278									Gaseous
B	"	"	5" OFA	10.5	9.2	126	241									↓
C	"	"	15" OFA	125	78	85	341									
D	"	"	10" OFA	11.0	8.8	72	248									
E	"	"	5" OFA	10.8	9.0	124	242									
F	"	"	15" OFA	12.0	8.2	80	332									

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

GASEOUS EMISSION SUMMARY

Location: ABMA SITE D

Fuel: Ohio - 12, 13, Century 14-21
Victoria Coal 22 & 23

TEST NO.	DATE	LOAD %	CONDITIONS	Boiler Outlet						Stack						
				O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
12	9-6-78	87	high O2 10" OFA	8.4	11.4	321	188	0		9.3	10.7	352	198			PART BLR & STACK
13A	9-7-78	89	norm O2 5" OFA	7.8	11.9	2301	170	4		8.2	11.6	2800+	176			↓
B			7" OFA	7.4	12.1	640	149									gaseous
C			15" OFA	7.6	12.0	73	209									
D			10" OFA	7.6	12.0	378	224									↓
14	9-11-78	87	norm O2, 7" OFA	7.5	12.2	6.8	226	-1		8.2	11.4	408	211			PART BLR & STACK
15	9-12-78	88	norm O2 15" OFA	7.8	11.6	39	217	0		8.7	11.0	39	219			
16	9-13-78	64	norm O2 10" OFA	8.7	10.5	25	234	0		9.6	10.1	28	244			
17	9-14-78	87	norm O2 10" OFA	7.3	12.0	885	199	0		7.9	11.5	8.3	205			
18	9-15-78	79	low O2, 12" OFA	8.1	11.2	34	230	-7		8.8	10.6	31	234	1272	0	↓ + SOx
19	9-15-78	79	low O2, 12" OFA	9.0	10.4	22	152									PDS
20	9-15-78	79	low O2, 9" OFA	10.5	9.5	15	147									
21	9-15-78	79	low O2 5" OFA	11.4	8.5	12	159									↓
22	9-21-78	59	norm O2, norm OFA	10.2	10.0	29	243							1274	10	SASS & SOx
23	9-22-78	61	norm O2, norm OFA	10.4	9.6	14	200			10.9	9.5	19	262			PART - BLR & STACK

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA site D

TEST NO 1

DATE 7/27/78

FUEL Ohio Coal

LOAD 3/4

CONDITIONS ~9.0%

DATA TAKEN BY MO

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO · ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
5	2:30	8.1	11.2	80	112	130	182									
6	2:40	8.0	11.30			130	180									
7.	2:50	8.2	11.2			130	183									
2	3:00	9.5	10.0			120	188									

AVERAGES

2-7		8.45	10.93	▨	112	▨	183	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA Site D

TEST NO 2

DATE 7/28/78

FUEL Ohio Coal

LOAD 75%

CONDITIONS low OFA

DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
2-7	9:25	9.0	10.2			130	195									
2-7x4	9:35	8.9	10.4			140	209									
2	9:55	9.6	9.6			130	206									
3	10:05	9.6	9.6			135	214									
4	10:15	9.3	10.0			145	224									
5	10:30	8.6	10.4			140	204									
6	10:40	8.65	10.5			160	234									
7	10:50	8.0	10.9			160	220									
3-7	11:10	8.4	10.4			120	179									
1	11:35	12	7.4			100	201									
2-7x5	11:55	8.8	10.4			125	185									
1	12:15	12	7.4			100	201									
2,3,4	12:25	9.3	10.0			125	193									

AVERAGES

BLR OUT		8.97	10.2	▨	206	▨		▨		▨		▨		▨		
Stack		12	7.4	▨	201	▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE	ABMA site D	FUEL	Ohio Coal
TEST NO	3	LOAD	60 klbs/hr.
DATE	8/4/78	CONDITIONS	As found (wet coal)
		DATA TAKEN BY	MJ

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO2 unc	NO2 cor	HC unc	HC cor	REMARKS
2-C	18:00	11.2	8.2	65	120	115	212									Temp °F
1	18:15	11	8.4	50	90	110	199									Dry 69
2	18:30	10.3	9.0	30	51	130	219									Wet 57
3	18:45	10.0	9.4	65	107	130	213									
4	19:00	10.0	9.3	40	66	120	197							7	11	
6	19:30	9.8	9.4	160	258	150	242							13	21	
7	19:45	9.6	9.2	65	108	135	245									
2-7+4	20:00	10.1	9.2	65	108	145	240									
5	20:15	9.5	10	35	55	150	235									
1	20:30	10.3	9.0	25	42	135	228									

AVERAGES

2-7		10.1	9.3	▨	108	▨	225	▨		▨		▨		▨	16	
1		10.6	8.9	▨	66	▨	213	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE Abma Site D

TEST NO #4

DATE 8/15/78

FUEL Ohio Coal

LOAD 75%

CONDITIONS 10% O.E.A.

DATA TAKEN BY Mj

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry) unc	CO · ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
2-7×4	10:40	9.2	10	12	17	145	222									Temp °F
1	10:55	9.7	9.5	8	13	140	224									Wet 78
2	11:10	9.1	10.0	17	26	160	243									Dry 88
4	11:25	9.9	9.2	16	26	150	244									
5	11:40	8.9	10.1	14	21	168	250									
6	11:55	9.2	10.0	12	18	150	229									
7	12:10	8.5	10.4	15	22	155	224									
1	12:25	10.3	9.0	15	25	140	236									
3	12:45	10.1	9.0	18	30	140	238									
2-6×4	13:05	9.3	10.0	20	31	155	239									

AVERAGES

BL Rout		9.3	9.8	▨	24	▨	235	▨		▨		▨		▨		
Stack		10.0	9.25	▨	19	▨	230	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D

TEST NO 5

DATE 8/16/78

FUEL Ohio Coal

LOAD 80 klb/hr

CONDITIONS 10" OFA, as found O_2

DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET) NOx		NO		NO_2		HC		REMARKS
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
2-6x4	13:05	7.8	11.4	70	96	145	192									Temp °F
1	13:20	8.5	10.7	55	79	155	224									wet 68°F
2-3	13:45	8.7	10.4	35	51	162	238									Dry 77°F
1	14:00	8.2	11.0	150	211	170	239									
3,5,6,7	14:15	7.5	11.6	122	163	160	214									
3	14:20	9.1	10.0	30	46	160	243									
5	14:30	7.2	12.0	80	105	175	229									
6	14:40	7.0	12.2	160	206	175	225									
7	14:50	7.0	12.0	55	71	170	219									
2	15:00	7.9	11.5	25	34	170	234									
4	15:10	8.2	11.0	40	56	170	240									
2-7x3	15:20	7.6	11.3	50	67	150	202									
1	15:35	8.4	10.6	80	115	140	200									
3	15:45	9.0	10.2	30	45	143	215									
3-7	16:00	8.2	10.9	92	130	145	204									

AVERAGES

Blr Out		7.9	11.2	▨	89	▨	222	▨		▨		▨		▨		
Stack		8.4	10.8	▨	148	▨	221	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D

TEST NO 6

DATE 8/18/78

FUEL Ohio Coal

LOAD 60 klb/hr

CONDITIONS 5" OFA as found O_2

DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NO_x		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
3-7	9:00	8.8	10.9	75	111	118	175									
1	9:15	9.6	10.3	65	103	118	187									
2-7×3	9:30	8.1	10.6	55	81	128	188									
1	9:45	9.4	10.2	55	86	125	195									
2-7	10:10	8.6	11.2	70	111	122	178									
2	10:20	8.9	10.9	92	137	122	190									
3	10:30	9.7	10.0	92	147	120	192									
5	10:40	7.7	12.0	85	115	130	176	135	183							
6	10:50	8.3	11.4	50	71	118	168	125	178							
7	11:00	8.2	11.2	28	39	125	176	128	180							
1	11:10		10.4													
2,3,4	12:15	9.5	10.0	-	55	118	185	118	185				0			
4	12:30	9.3	10.3	30	50	129	199	129	199				0			
5	12:45	8.3	11.1	30	43	132	186	135	191				5			

AVERAGES

Blr. Out		8.7	10.9	▨	87	▨	184	▨	186	▨		▨	1	▨		
Stack		9.8	10	▨	73	▨	189	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D

TEST NO #7

DATE 8-22-78

RH 68% w-71

D-79

FUEL OHIO COAL

LOAD 60 K

CONDITIONS High O.F.A

DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO · ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
2-6	5:25	9.7	10.1	18	29	144	230	146	233							
1	5:40	10.7	9.4	18	32	145	254	145	254							
2-7-5-6	6:00	10.0	10.0	16	26	150	246	150	246							
1	6:15	11.0	9.4	14	25	140	253									
2	6:25	10.5	9.7	16	28	150	258									
3	6:35	10.9	9.2	15	28	150	268									
5	6:50	9.8	10.0	15	24	165	266									
6	7:00	9.9	10.0	15	24	165	268									
7	7:10	9.3	10.5	18	31	170	295									
4	7:20	10.6	9.7	18	31	135	235									
1	7:30	10.9	9.4	18	32	130	233	132	236							
4,5,6,7	7:40	11.0	9.4	18	33	140	253	130	235							
1	8:00	11.0	9.2	16	30	130	235									
3-7	8:15	10.5	10.0	18	31	134	230									

AVERAGES

BLR OUT		10.2	9.9	▨	28.5	▨	255	▨	238	▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
STACK		10.9	9.4	▨	29.8	▨	244	▨	245	▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D
TEST NO. #8
DATE 8-23-78

FUEL Oil
LOAD 60 K lb/hr
CONDITIONS high O2
DATA TAKEN BY MJ

Probe Position	Am Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM(WET) NOx unc	NOx cor	NO unc	NO cor	NO2 unc	NO2 cor	HC unc	HC cor	Remarks
3 - 7	11:35	9.4	10.3	35	54	135	210	135	210							
1	11:50	10.5	9.4	30	52	132	227	133	229							
4,5,6,7	12:05	9.3	10.3	35	54	160	247									
2	12:20	10.1	9.7	35	58	158	262									
4	12:30	10.6	9.3	40	70	150	261									
5	12:40	9.2	10.4	35	54	140	214									
6	12:50	9.5	10.2	35	55	135	212									
7	1:00	9.0	10.6	35	53	140	211									
1	1:10	10.6	9.4	38	66	120	208	120	208							
3	1:25	10.8	9.2	30	53	120	213									
2,3,5,6,7	1:35	9.7	10.2	40	64	130	208	130	208							
1	1:55	10.5	9.7	40	69	120	207	122	210							
~~2~~	~~2:10~~															
~~3~~	~~2:35~~															
Blr Out	AVG.	9.7	10.0		57		226		209							
Stack	AVG.	10.5	9.5		62		214		219							
	AVG.															

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D
TEST NO. #9
DATE 8-29-78

FUEL Pertect 8
LOAD 40K
CONDITIONS Norm
DATA TAKEN BY

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM(WET) NOx		NO		NO2		HC		Remarks
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
34567	3.35	11.5	8.5	20	38	120	228									
1	350	12.3	7.6	18	37	120	250									
24567	415	11.5	8.6	35	67	135	257	134	255							
2	430	11.8	8.2	32	62	140	275	~~278~~								
3	440	12.2	7.8	25	51	135	278									
5	450	11.3	8.7	25	47	150	280									
6	500	11.5	8.6	25	48	150	286									
7	510	10.9	9.0	30	54	160	286									
23567	520	11.5	8.6	28	53	130	247	130	247							
23567	525	11.8	8.3	38	75	125	246	125	246							
23457	540	11.8	8.4	40	79	130	256	130	256							
4	555	11.6	8.6	28	54	135	260	135	260							
1	505	12.0	8.2	25	50	128	257	128	257							
234567	515	11.3	8.8	25	47	135	252	135	252							
234567	630	11.4	8.7	28	53	135	254	135	254							
Blr out	AVG.	11.5	8.5	▨	56	▨	262	▨		▨		▨		▨		
Stack	AVG.	12.2	7.9	▨	44	▨	254	▨	257	▨		▨		▨		
for Nox	AVG.	→		▨		▨	253	▨	253	▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D

TEST NO #10

DATE 8-31-78

FUEL Per. 8

LOAD 60 K

CONDITIONS

DATA TAKEN BY MJ + JC

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(drv)		HOT LINE SAMPLES, PPM (WET) NOx		NO		NO2		HC		REMARKS
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
2-3-4-5-6	4:35	9.8	10.4	28	45	135	218									
2345	5:00	10.1	10.0	35	58	135	224									
2347	5:15	10.5	10.0	32	55	138	238									
2	5:30	10.1	10.0	48	80	140	232									
3	5:41	10.5	9.8	40	69	142	244									
5	5:52	9.25	10.6	35	54	160	246									
7	6:03	9.0	11.2	37.5	56	170	256									
1	6:15	10.5	9.4	44	76	148	255									
6	6:25	9.75	10.4	35	56	140	225									
4	6:45	10.5	10.0	44	76	126	217									

AVERAGES

BLR		9.9	10.3	▨	61	▨	238	▨		▨		▨		▨		
STACK		10.5	9.4	▨	76	▨	255	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D
TEST NO. 11
DATE 8/31/78
FUEL Pcr 8
LOAD 52 K
CONDITIONS Vary O.F.A.
DATA TAKEN BY J.C.

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM(WET) NOx unc	NOx cor	NO unc	NO cor	NO2 unc	NO2 cor	HC unc	HC cor	Remarks
A 2-7 H+L 10"	3:45	11.25	8.5	35	65	150	278									At 15" O_2 in Furnace builds up because of lack of fuel. ~~[illegible]~~ Therefo Air continues increase + load drops.
B 2-7 H+L 5"	3:35	10.5	9.2	73	126	140	241									
C 2-7 H+L 15"	4:20	12.5	7.8	40	85	160	341									
D 2-7 H+L 10	5:30	110	8.8	40	72	165	298									
E 2-7 H+L 5	5:50	10.75	9.0	73	129	160	282									
F 2-7 H+L 15"	6:15	12	9.2	40	80	165	332									
	AVG.															
	AVG.															
	AVG.															

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D
TEST NO #12
DATE 9-6-78
FUEL Per 8
LOAD 80K
CONDITIONS
DATA TAKEN BY MJ

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(dry)		LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
34567	11.45	8.3	11.3	100	142	130	242									
1	12.00	9.6	10.4	150	238	122	193									
24567	12.20	7.7	12.2	300	407	130	176									
2	12.35	9.0	10.9	300	451	135	203									
1	12.40	9.0	11.0	310	466	135	203	135	203		0					
23567	12.55	8.0	11.6	250	347	130	180	130	180		0					
23467	13.10	8.4	11.4	190	272	130	186	130	186		0					
23457	13.30	8.5	11.2	280	404	135	195									
2345	13.45	8.6	11.2	190	277	130	189	130	189		0					
234567	—	8.3	11.4	190	270	135	192									

AVERAGES Average of 3

BlrOut	AVG.	8.35	11.4	▨	321	▨	188	▨	*185	▨	0	▨		▨		
Stack	AVG.	9.3	10.7	▨	352	▨	198	▨	203	▨		▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D
TEST NO # 13 Vary of A
DATE 9-8-78
FUEL Per 8
LOAD 80 K
CONDITIONS 10.0" of A Vary of A
DATA TAKEN BY MJ

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET) NOx		NO		NO2		HC		8.4 80 REMARKS 7.8 89
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
23456	10.30	7.8	11.8	1800	2459	120	164	120	164		0					8.4 90 100+ 100+
2345	10.40	7.7	12.0	1645	2231	130	176	135	183		+7					Peaks In Excess
1	10.55	8.2	11.6	2000	2819	125	176	125	176		0					of meter full
23567	11.15	7.5	12.0	580	775	140	187	145	194		+7					scale
1	11.30	8.3	11.4	510	724	140	199	140	199		0					11.10 over-
23567	11.45	7.2	12.2	580	759	160	209	160	209		0					fire Air Raised
1	12.00	8.3	11.4	270	384	150	213	150	213		0					2" To 7"(
34567	12.15	7.3	12.1	420	553	170	224	170	224		0					CO changed
34567	12.30	7.6	12.0	350	471	125	168	125	168		0					from Over
																2000ppm to 250
34567		7.6	12.0		40	73	150	202						Vary of A		of A 15
		7.6	12.0		280	378	148	199								of A 10

AVERAGES

Blr Out	AVG.	7.5	12.0	▨	1225	▨	188	▨	190	▨	2	▨		▨		
Stack	AVG.	8.3	11.5	▨	1390	▨	196	▨	196	▨	0	▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D
TEST NO #14
DATE 9/11/78

FUEL Century Coal
LOAD 80 k lb/hr
CONDITIONS low OFA
DATA TAKEN BY MJ

Probe Position	Time	O2 % (dry)	CO2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM (WET)								REMARKS
								NOx		NO		NO_2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
3-7	12:00	7.1	13	610	791	155	201	145	188							
1	12:10	8.1	11.4	420	587	145	203	150	210							
2-7 x3	12:25	7.2	12.2	580	758	141	286	148	286							
1	12:35	8.2	11.4	440	620	140	197	145	204							
2-7x4	12:50	7.3	12.2	700	921	150	197	150	197							
1	13:05	8.2	11.4	350	493	150	211	150	211							
2-7x4	13:20	7.4	12.2	440	583	160	212	161	213							
2-7x6	13:35	7.6	12.0	270	363	165	222	170	229							
1	13:45	8.3	11.4	205	291	165	234	165	234							
2-6	14:00	8.4	11.4	205	294	165	236	165	236							

AVERAGES

Blr. Out		7.5	12.2	▨	618	▨	226	▨	225	▨	-1	▨		▨		
Stack		8.2	11.4	▨	498	▨	211	▨	215	▨	4	▨		▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

· NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D

TEST NO. 15

DATE 9/12/78

FUEL Kent. Century

LOAD 80K

CONDITIONS OFA 15"

DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM(WET)								Remarks
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
2-4	11:35	7.8	11.6	65	89	150	205	152	208							
-1-	11:50	8.5	11.2	40	58	145	209	145	209							
2-54	12:05	8.4	11.2	25	36	155	222	155	222							
-1-	12:20	8.6	11.0	40	58	150	218	150	218							
3-7	12:40	7.9	11.5	20	27	160	220	160	220							
-1-	12:55	8.7	11.0	19	28	150	220	150	220							
4-7	1:10	7.7	11.6	20	27	162	220	162	220							
-1-	1:25	8.8	11.0	20	30	150	222	150	222							
5-7	1:40	7.5	12.0	20	27	160	214	160	214							
-1-	155	8.7	11.0	20	29	145	213	148	217							
3567	210	7.8	11.4	20	27	160	219	160	219							
-1-	230	9.0	10.6	19	29	155	233	155	233							
3-7	2:45	7.7	12.0	30	41	160	217	160	217							
	AVG.	7.8	11.6	▨	39	▨	217	▨	217	▨	0	▨		▨		
	AVG.	8.7	11.0	▨	39	▨	219	▨	220	▨	+1	▨		▨		
	AVG.			▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D
TEST NO. 16
DATE 9-13-78

FUEL Kent Century
LOAD 60k
CONDITIONS normal O2, and O.F.A
DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM(WET)								Remarks
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
23567	1.10	8.7	11.0	17	25	160	235	160	235							
-1-	1.25	9.7	10.0	18	29	155	248	155	248							
2[illegible]567	1.45	8.3	11.0	20	28	160	227	160	227							
-1-	1.55	9.5	10.2	20	31	150	236	150	236							
24567	2.10	8.9	10.6	17	25	150	224	150	224							
567	230	8.5	10.9	17	25	160	231	160	231							
234	235	9.1	10.4	15	23	155	235	155	235							
-1-	250	9.7	10.1	15	24	155	248	155	248							
234	305	8.8	10.6	16	24	170	251	170	251							
Blr Out	AVG.	8.7	10.8	▨	25	▨	234		234			▨		▨		
Stack	AVG.	9.6	10.1	▨	28	▨	244		244			▨		▨		
	AVG.			▨		▨						▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D

TEST NO. 17

DATE 9-14-78

FUEL K&J. Century

LOAD 75 K

CONDITIONS Norm OFA

DATA TAKEN BY RJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM(WET)								Remarks
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
2-7	11.00	7.9	11.3	140	193	140	193	140	193							
2-6	1110	8.1	11.3	310	434	140	196	140	196							
-1-	1125	8.0	11.4	235	326	148	205	145	205							
2-3-4-7	1135	7.9	11.4	122	170	150	206	150	206							
-1-	1150	8.4	11.0	40	57	150	215	150	215							
23567	1205	7.0	12.4	720	927	160	206	160	206							
-1-	1220	7.9	11.4	430	592	150	206	150	206							
23567	1240	7.1	12.0	810	1051	152	197	152	197							
-1-	1250	7.7	11.6	890	1207	145	197	145	197							
24567	1 05	6.8	12.4	1610	2043	150	190	150	190							
34567	1 15	6.6	12.8	900	1127	160	200	160	200							
-1-	1.30	7.5	12.0	1410	1884	150	200	150	200							
34567	145	7.0	12.2	880	1133	160	206	160	206							
Blr Out	AVG.	7.3	12.0 [illegible]	▨	885	▨	199	▨	199	▨		▨		▨		
Stack	AVG.	7.9	11.5	▨	813	▨	205	▨	205	▨		▨		▨		
	AVG.			▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE Above site D

TEST NO 18

DATE 9-15-78

FUEL Kent. Century

LOAD 80 Klb/hr

CONDITIONS As found

DATA TAKEN BY mj & J.B

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
2-7	10 40	8.2	11.1	25	35	160	236									
3-7	10 50	8.0	11.3	25	35	175	243									
1	11 05	8.9	10.6	20	30	150	224									
3-7	11.10	8.0	11.3	22	31	153	219									
5-7	11.45	7.6	11.4	27	37	160	222	160	222							
1	11 30	8.7	10.6	25	37	155	227									
2	12 10	8.3	11.2	29	41	162	230									
3,5,6,7	12 15	8.2	11.1	20	28	168	237	155	218							
3,4,6,7	12.25	8.4	11.1	20	29	167	233	163	228							
1	12.30	9.4	10.1	17	25	165	257	167	244							

AVERAGES

[illegible]		[illegible]	[illegible]	▨	[illegible]	▨	232	▨	227	▨		▨	-7	▨		
Stack		[illegible]	[illegible]	▨	[illegible]	▨	234	▨	244	▨		▨	-2	▨		
				▨		▨		▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE ABMA Site D

TEST NO 19, 20 + 21

DATE [illegible]/13/78

FUEL Century Coal

LOAD

CONDITIONS

DATA TAKEN BY DCB, MC, DPP

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
3	#19	8.9	10.4	25	37	133	228		B.+/c		"	1344				Test #19
3	}	9.0	10.3	[illegible]	30	135	235		"		"	1181				12" OFA
3	|	9.0	10.4	20	30	135	233		"		"	977				Load 72 klb/hr
3	#20	10.5	9.6	17	24	142.5	251		"		"	1349				Test #20
3	}	10.5	9.4	15	26	142.5	254		"		"	972				4" OFA
3	}	10.6	9.4	12	21	145	252		"		"	1435				52 klb/hr
3	#21	11.3	8.6	12	22	155	289		"		"	1457				Test #21
	}	11.6	8.4	13	25	156	300		"		"	1465				15" OFA

AVERAGES

#19		9.0	10.4	▨	32	▨	231	▨		▨		▨		▨		
#20		10.5	9.5	▨	25	▨	253	▨		▨		▨		▨		
#21		11.5	8.5	▨	24	▨	295	▨		▨		▨		▨		
				▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D

TEST NO. 22

DATE 9-21-78

FUEL Victoria

LOAD ~55 K

CONDITIONS normal

DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM(WET)								Remarks
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
34567	3.40	10	10	14	23	152	250									
34567	430	10.8	9.4	11	19	150	266									
34567	515	10.0	10.2	12	20	170	279									
34567	645	10.0	10.2	17	28	145	238									
3457	715	10.2	10.0	16	27	145	243									
3457	800	10.2	10.0	13	22	145	243									
—6—	8.30	10.25	10.0	17	29	143	240									Sox O2
3457	845	10.0	10.0	17	28	140	230									
-6-	910	10.0	10.2	17	28	140	230									
3457	10.30	10.2	10.2	25	42	135	226									
3457	10.55	10.5	9.7	28	48	130	224									
B/r Out	AVG.	10.2	10.0		28.5		243									
	AVG.															
	AVG.															

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE D
TEST NO. 23
DATE 9-22-78

FUEL Victoria
LOAD 255K
CONDITIONS Port Test.
DATA TAKEN BY

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry)		NO ppm(dry)		HOT LINE SAMPLES, PPM(WET)								Remarks
								NOx		NO		NO2		HC		
				unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	unc	cor	
3457	10.30	10.4	10.0	11	19	145	247									
-1-	1040	11.0	9.4	12	22	140	253									
[illegible]3,4	1055	10.8	9.4	12	21	148	262									
23567	1105	10.5	9.7	14	24	145	250									
-1-	1120	10.8	9.4	11	19	150	266									
567	1135	10.0	10.3	10	16	165	271									
-1-	1155	11.3	9.2	10	19	145	270									
24567	1210	10.3	10.2	10	17	160	270									
-1-	1225	10.5	10.0	8	14	150	258									
Blr	AVG.	10.4	9.9	▨	19.9	▨	260	▨		▨		▨		▨		
Stack	AVG.	10.9	9.5	▨	18.5	▨	262	▨		▨		▨		▨		
	AVG.			▨		▨		▨		▨		▨		▨		

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

REPORT

TRUESDAIL LABORATORIES, INC.

CHEMISTS - MICROBIOLOGISTS - ENGINEERS
RESEARCH — DEVELOPMENT — TESTING

4101 N. FIGUEROA STREET
LOS ANGELES 90065
AREA CODE 213 • 225-1564
CABLE: TRUELABS

CLIENT IVP, Inc.
[illegible] South County Rd 18 Suite 1375
Minneapolis, Minn. 55426
Attn: Jim Gabrielson

DATE October 9, 1978

RECEIVED September 7, 1978

LABORATORY NO. [illegible]

SAMPLE Eight (8) flue gas sample flasks

INVESTIGATION

Shipping of eight NOx sample flasks. Analysis of returned samples for Nitrogen oxides by PDSA method. Analysis for CO_2 and O_2 of the gas phase of each of the sample flasks.

RESULTS

Flask No.	Flask Vol., liters	Sample pressure absolute, "Hg, dry	Nitrogen oxides (NO_2) micrograms	ppm NOx (dry)	CO_2, %	O_2 %
1344	2.048	11.7	263.	177.	9.7	11.2
1187	2.018	14.3	263.	147.	10.0	9.3
977	2.078	14.3	279.	149.	10.0	10.1
1349	2.121	13.2	236.	136.	8.7	11.3
972	2.065	15.5	279.	140.	9.8	9.3
1435	2.048	14.5	265.	143.	9.1	10.3
1457	2.054	14.7	299.	159.	8.1	11.6
1465	2.092	13.5	258.	147.	8.2	11.4

Note: The sample flasks had very high residual vacuums. The Orsat analysis for CO_2 and O_2 may be not too accurate due to the sample size.

Respectfully submitted,

TRUESDAIL LABORATORIES, INC.

IGNAS BANDZIULIS
Supervisor,
Air Pollution Testing

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from these Laboratories.

KVB NO$_x$ samples [illegible]

TEST #19	Bottle #	1344	1187	977
OF.A 12"	% O_2	89	90	90
Century Coal	% CO_2	104	103	104
72 Klbs/hr	CO ppm	25	20	20
	NO ppm	153	155	155

Test #20	Bottle #	1349	972	1435
OFA 9"	% O_2	10.5	10.5	10.6
52 K lbs/hr	% CO_2	96	94	9.4
	CO ppm	17	15	12
	NO ppm	148	148	145

Test #21	Bottle #	1457	1465
OFA 15"	% O_2	113	116
52 Klbs/hr	% CO_2	86	84
	CO ppm	12	13
	NO ppm	155	156

Local D

SOx DATA SHEET

Date 9-15-78 Probe Location & Probe Length

Unit # 4 Fuel Kent (Century) Load 71 Klbs

est Description: Test #18 Site D

Test No.	Box No.	Sample Time	Meter Temp. (T)	(p) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
1A	1	1120	79	0	1	29.45	2	20	8.3
		1200							
2B	2	1220	82	0	1	↓	↓	20	
		1240							
3C	3	1245	82	0	1			20	
		105							

SAMPLED BY E

Test # 1A Test # 2B Test # 3C

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0113			.0113			.0113		
Dilution Factor F	20			20			20		
Spike	7.70	7.7							
~~Blank~~ B	7.70	7.7							
Blank=0	7.70	7.7							
Averages	7.70								
Ml. of Titrant A	10.30	7.6		8.70	7.5		7.85	6.8	
	10.30			8.80			7.90		
	10.35			8.80			7.90		
Averages	10.32	7.6		8.76	7.5		7.88	6.8	
460 + T			539			542			542
Sample Vol. V	1			1			1		
P + p	29.45								
A - B	10.32	~~7.6~~-.1		8.76	~~7.5~~-.2		7.88	~~6.8~~-.9	

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(10.32)(.0113)(20)(539)24}{(\quad)(29.45)}$$

$SO2 = \boxed{1024.5}$ $SO3 = \boxed{0}$

$$SO3 = \frac{(\quad)(\quad)(\quad)(\quad)24}{(\quad)(\quad)}$$

SO2 @ 3% O2 = 1455.0
SO3 @ 3% O2 = 0
SOx @ 3% O2 = 1455

$$SO2 = \frac{(8.76)(.0113)(20)(542)24}{(\quad)(29.45)}$$

$SO2 = \boxed{874.5}$

$$SO3 = \frac{(\quad)(\quad)(\quad)(\quad)24}{(\quad)(\quad)}$$

$SO3 = \boxed{0}$

SO2 @ 3% O2 = 1242.0
SO3 @ 3% O2 = 0
SOx @ 3% O2 = 1242.0

$$SO2 = \frac{(7.88)(.0113)(20)(542)24}{(\quad)(\quad)}$$

$SO2 = \boxed{786.6}$

$$SO3 = \frac{(\quad)(\quad)(\quad)(\quad)24}{(\quad)(\quad)}$$

$SO3 = \boxed{0}$

SO2 @ 3% O2 = 1117.5
SO3 @ 3% O2 = 0
SOx @ 3% O2 = 1118

Local APMA SITE P

SOx DATA SHEET

Date 9/21/78 Probe Location & Probe Length 5'

Unit # 4 Fuel Victoria Load 53 klbs/hr

Test Description: Test #22

Test No.	Box No.	Sample Time	Meter Temp.(T)	(p) Meter Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
A	#1	—	71	-0-	0.000	29.82	5	20:01	
		—	72	-0-	1.000			20:31	10.25
B	#2	20:15	73	-0-	0.000			20:34	
		20:29	73	-0-	1.000			21:04	10.25
C	#3	20:50	73	-0-	0.000			21:10	
		21.04	73	-0-	1.000			21:40	10.0

SAMPLED BY ______

Test # A Test # D Test # C

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0113								
Dilution Factor F	20								
Blank B	7.7								
	7.7								
	7.6								
Averages	7.66								
Ml. of Titrant A	7.9			7.5			8.2		
	8.2	8.3		7.4	8.6		8.2	9.8	
	8.1			7.5			8.25		
Averages	8.06	8.3		7.46	8.6		8.22	9.8	
460 + T	532			533			533		
Sample Vol. V	1.000								
P + p	29.82								
A - B	8.06	.64		7.46	.94		8.22	2.14	

TITRATED BY ______

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(8.06)(.0113)(20)(532)24}{(\ )(\ )_{29.82}}$$

SO2 = $\boxed{779.9}$ SO3 = $\boxed{3.1}$

$$SO3 = \frac{(.64)(.0113)(1)(532)24}{(\ )(\ )_{29.82}}$$

SO2 @ 3% O2 = 1311.0
SO3 @ 3% O2 = 5.0
SOx @ 3% O2 = 1316.0

$$SO2 = \frac{(7.46)(.0113)(20)(533)24}{(\ )(\ )_{29.82}}$$

SO2 = $\boxed{715}$

$$SO3 = \frac{(.94)(.0113)(1)(533)24}{(\ )(\ )_{29.82}}$$

SO3 = $\boxed{4.56}$

SO2 @ 3% O2 = 1215.2
SO3 @ 3% O2 = 7.7
SOx @ 3% O2 = 1222.9

$$SO2 = \frac{(8.22)(.0113)(20)(533)24}{(1)(\ )_{29.82}}$$

SO2 = $\boxed{759.0}$

$$SO3 = \frac{(2.14)(.0113)(1)(533)24}{(1)(\ )_{29.82}}$$

SO3 = $\boxed{10.3}$

SO2 @ 3% O2 = 1295.7
SO3 @ 3% O2 = 16.9
SOx @ 3% O2 = 1312.6

SECTION 4.0

SPECIAL TESTS DATA

PAGE

4.1 MODIFIED SMOKE SPOT DATA SHEET 149

4.2 PARTICULATE SIZE DISTRIBUTION
  - BRINK 151
  - SASS 154
  - BAHCO 156

SMOKE SPOT DATA SHEET

TEST SITE ABMA Test Site D

TEST NO.	NO. PUMPS	READING	PARTICULATES lb/10^6BTU	COMBUSTIBLES %	COMBUSTIBLES lb/10^6BTU
2	1	3,4	—		
	2	4,5	—	Stratified	Test
	3	4½, 5½	—		
3	1	4,4	0.355	35.2	0.125
	2	4½, 5	↓	↓	↓
	3	5½, 5½	↓	↓	↓
4	1	½, ½	0.557	23.7	0.132
	2	2½, 2½	↓	↓	↓
	3	2½, 3	↓	↓	↓
5	1	4½, 5	0.574	28.4	0.163
	2	5½, 6	↓	↓	↓
	3	6,7	↓	↓	↓
9	1	1	0.456	14.4	0.066
	2	1,2	↓	↓	↓
	3	2,2	↓	↓	↓
12	1	4, 4½	0.667	14.3	0.095
	2	6,6	↓	↓	↓
	3	7,7	↓	↓	↓
13	1	3,3	0.490	28.2	0.138
	2	5,5	↓	↓	↓
	3	5,6	↓	↓	↓

KVB

SMOKE SPOT DATA SHEET

TEST SITE ABMA Test Site D

TEST NO.	NO. PUMPS	READING	PARTICULATES lb/10^6BTU	COMBUSTIBLES %	COMBUSTIBLES lb/10^6BTU
15	1	3	0.424	23.6	0.100
	2	3, 3½	↓	↓	↓
	3	4, 4			
16	1	1	0.319	25.9	0.083
	2	1½, 2	↓	↓	↓
	3	2, 2			

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 15
TEST SITE D
TEST DATE 9/12/78
SAMPLE LOCATION Blr. Out

LOAD 80 K
% O_2 8
FUEL Century
SPECIAL CONDITIONS High OFA (15' H_2O)

ρp - Density of particles 2.5 g/cm^3
μ - Viscosity of flue gas 2.35 × 10^{-4} poise
MWs - Molecular wt. flue gas 29.4 g/g mole
ΔP_I - Pressure drop across impactor 9.5 in H_2O
Ps - Absolute stack pressure 29.31 in. Hg
Ts - Absolute stack temperature 820 °R
Qs - Actual flow rate at stack conditions 0.049 ft^3/min

Vm - Dry gas volume N.A.* SCF
Mn - Total particulate mass 15.6 mgm
Cn - Total concentration N.A. grains/SCF
I - Percent isokinetics 91.0 %
Vs - Gas velocity 11.03 ft/sec.
Dn - Nozzle diameter 0.117 in.

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm		0.2490	0.1775	0.1396	0.0946	0.0781	
Fj - Press. factor, n.d.		0.0210	0.0273	0.0395	0.0903	0.3277	
$D_{s,\overline{50}}$ Stokes diameter, μm		3.43	2.00	1.35	0.69	0.42	
$D_{A,\overline{50}}$ Aerodynamic diameter, μm		5.51	3.25	2.22	1.17	0.75	
$D_{AI,\overline{50}}$ Aerodynamic impaction diameter, μm		5.67	3.41	2.38	1.33	0.90	
Mn - Particulate mass, mgm	11.5	1.9	0.7	0.2	0.1	0.3	0.9
% - Percent of Total	73.72	12.18	4.49	1.28	0.64	1.92	5.77
Cumulative percent	26.28	14.10	9.61	8.33	7.69	5.77	
Cn - Concentration, grains/SCF	—	—	—	—	—	—	—
Cumulative concentration, grains/SCF	—	—	—	—	—	—	—

* Not Available

#15900

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 15

LOAD 80 K

TEST SITE D

% O_2 8

TEST DATE 9/12/78

FUEL Century

SAMPLE LOCATION Blr. Out

SPECIAL CONDITIONS High OFA (5" H_2O)

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP 0.025

GAS TEMP. °R, Ts 820

PITOT CORRECTION FACTOR, Cp 0.837

BAROMETRIC PRESS in. Hg, P_{bar} 29.55

GAS STATIC PRESS in. H_2O -3.2

GAS STATIC PRESS in. Hg abs, Ps 29.31

MOLECULAR WT. FLUE GAS, MW_s 29.4

$$Vs = 85.48\ Cp\ \left(\frac{Ts\ \Delta P}{Ps\ MWs}\right)^{1/2} = 11.03$$ ft/sec

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn 0.117

NOZZLE AREA ft^2, An 7.466×10^{-5} $An = \pi(Dn/24)^2$

$Qn = Vs\ An\ 60$ = 0.049 ft^3/min at nozzle

$Qc = Qs\ \left(\frac{PsMWs}{1.3Ts}\right)^{1/2}$ = 0.044 ft^3/min corrected to calibration conditions

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 9.5 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 12.7 in. H_2O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL			74°F
FINAL	37.2		75°F
Δ			

$\%H_2O$ = 7.5 %

$$I = \frac{1.667\ Ts\ Vm\ P_{bar}}{\theta\ Tm\ Vs\ Ps\ An(1-\frac{\%H_2O}{100})} = 91.0\%$$

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. 15 - BLR OUT
LOCATION Site D
TEST DATE 9-12-78
ENGINEER
TEST DESCRIPTION High OFA - 15" H_2O

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.		9-11-78						→
TARE WT.	1	0.3974	3.5099	3.0923	3.9814	3.7804	3.9003	0.0442
	2	–	3.5099	3.0926	3.9814	3.7804	3.9004	0.0442
	3	–	3.5099	3.0926	3.9814	3.7801	3.9004	0.0442
	4							
AVERAGE		0.3974	3.5099	3.0925	3.9814	3.7803	3.9004	0.0442

POST TEST WEIGHTS (GRAMS)

DATE WT.								
GROSS WT.	1	0.4089	3.5118	3.0932	3.9916	3.7804	3.9007	0.0451
	2	–	3.5118	3.0933	3.9817	3.7805	3.9007	0.0451
	3	–						
	4							
AVERAGE		0.4089	3.5118	3.0932	3.9816	3.7804	3.9007	0.0451

NET TEST RESULTS (MILLIGRAMS)

NET WT.	0.0115	0.0019	0.0007	0.0002	0.0001	0.003	0.0009
PERCENT	73.72	12.18	4.49	1.28	0.64	1.92	5.77

TOTAL NET WEIGHT 15.6 mgm

SASS

~~PARTICULATE~~ LAB WORKSHEET

TEST NO. 22 BLR out (Inlet, Outlet) LOCATION Side D

Date ______ Box No. ______ Eng. ______

Test Description ______

Dry Gas Meter Vol (ft^3)

Final ______

Initial ______

Δ DgV ______

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		10μ cyclone [redacted]	3μ cyclone [redacted]	1μ cyclone [redacted]	FILTER NO.	BLANK NO.	
BOTTLE NO.		1	2	3	1	2	
BEAKER NO.		—	—	—	—	—	
DATE WT.		—	—	—	—	—	
TARE WT.	1	23.9190	23.5858	23.6285	1.2517	1.2393	
	2	23.9195	23.5862	23.6287	1.2518	1.2395	
	3	23.9194	23.5861	23.6282	1.2518	1.2394	
	4	—	—	—	—	—	
AVG.		23.9193	23.5860	23.6284	1.2518	1.2394	
POST TEST WTS.							
	1	26.0329	24.0894	24.1365	1.7768	1.6462	
	2	26.0331	24.0890	24.1367	1.7764	1.6461	
	3	26.0334	24.0891	24.1369	1.7760	1.6453	
	4	—	—	—	—	—	
AVG.		26.0331	24.0892	24.1367	1.7764	1.6458	
Δ WT.		02.1138	0.5032	0.5083	0,5246	0,4064	

Δ Vlc = ______ ml LOAD ______ klb/hr

Δ DgV = ______ ft^3 O_2 ______ %

Δ Mn ______ mgm REMARKS: ______

Impinger	# 1	# 2	# 3
vl —	820 ml.	770 ml	750 ml
Mass —	100 ml.	100 ml.	110 ml

SITE D

SASS GRAVIMETRICS

TEST 22	10µ	2.1138	47.89% Passing
	3µ	0.5032	35.48% Passing
	1µ	0.5083	22.95% Passing
	Filter	0.9310	
	Total	4.0563	

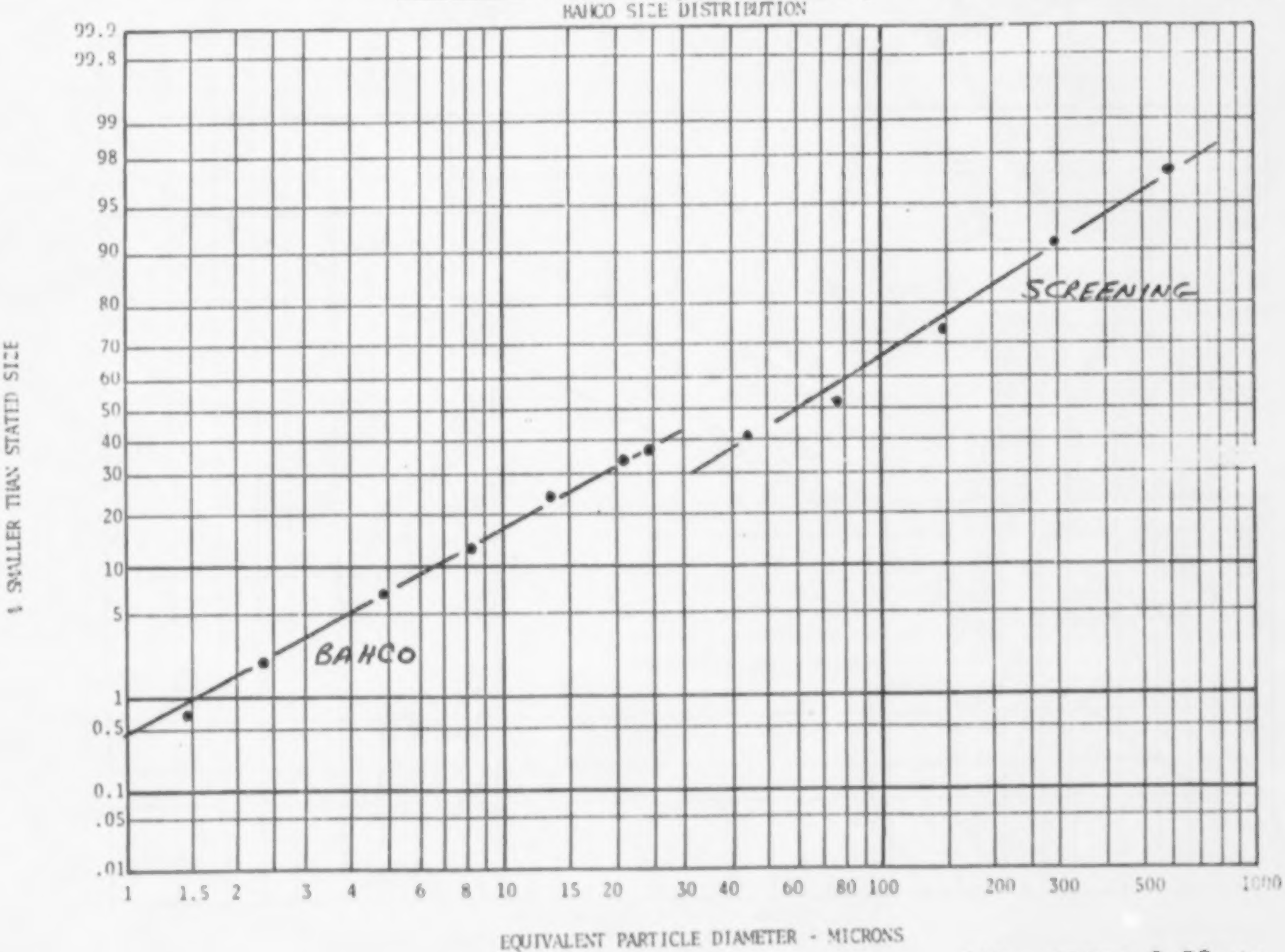
KVB-Research Cottrel Co.

S-10266
6779-01
February 6, 1979

Sample No.		K-22852		K-22853		K-22854	
Sample Description		Dust Collector Ash, Test #5 Site D 8-16-78		Dust Collector Ash, Test #17 Site D 9-14-78		Dust Collector Ash, Test #23 Site D 9-22-78	
Bahco Particle Size Determination							
% Through #100 (149 Microns)		73.3		71.8		63.1	
Results:	Terminal Velocity	Diameter (Microns)	% Smaller	Diameter (Microns)	% Smaller	Diameter (Microns)	% Smaller
	112	25.	37.4	25.	31.0	25.	15.1
	79.0	21.	33.8	21.	27.0	21.	12.5
	31.0	13.	24.3	13.	14.9	13.	7.6
	12.3	8.2	14.2	8.4	9.7	8.4	4.1
	4.15	4.8	6.7	4.9	4.7	4.9	2.3
	0.96	2.3	2.3	2.3	1.5	2.3	0.9
	0.35	1.4	0.7	1.4	0.6	1.4	0.4
Density, gms/cc (On #100 Mesh Material Only)		2.53		2.42		2.42	
Screen Sizing							
% Through #4	4760	100.0		100.0		100.0	
#10	2000	99.4		99.98		99.9	
#16	1190	98.9		99.96		99.8	
#30	595	96.9		99.1		99.0	
#50	297	90.7		94.0		93.4	
#100	149	73.3		71.8		63.1	
#200	74	51.4		48.0		31.2	
#325	44	40.5		35.6		18.7	

SAMPLE IDENTIFICATION KVO, Inc./
Dust Collector Ash, Test #5, Site D, 8-16-78

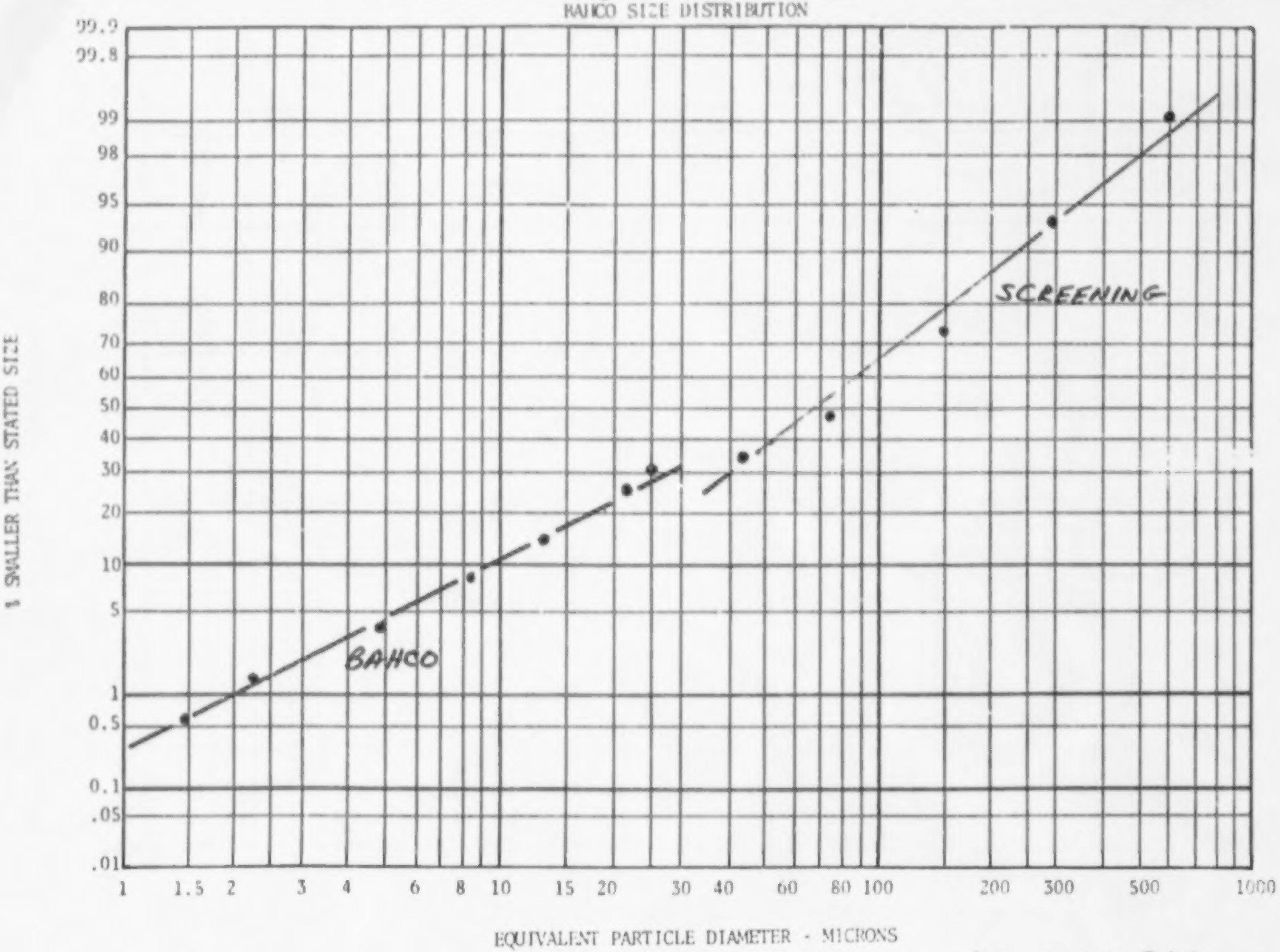
SAMPLE NO. K-22832
CHARGE NO. 6779-01



10Gm DENSITY 2.53 g/cc

SAMPLE IDENTIFICATION KVB, INC. /
DustCollector Ash, Test #17, Site D, 9-14-78

SAMPLE NO. K-22353
CHARGE NO. 6779-01

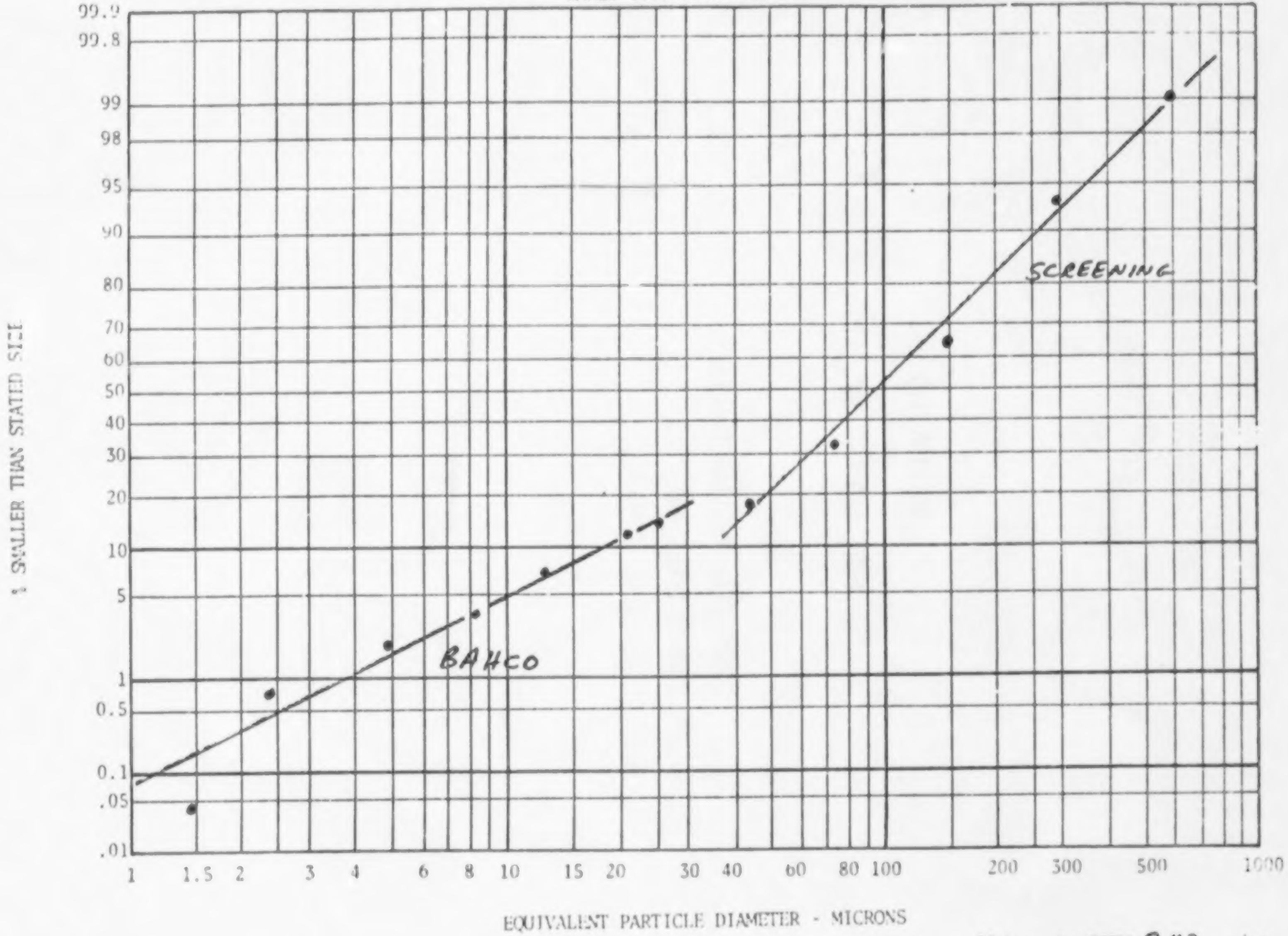


Mean DENSITY 2.43 g/cc

SAMPLE IDENTIFICATION KVB, INC. / Dust Collector Ash, TEST #23, SITE D, 9-22-78

SAMPLE NO. K-22854
CHARGE NO. 6779-01

BAHCO SIZE DISTRIBUTION



100μm DENSITY 2.42 g/cc

SECTION 5.0

FUEL AND ASH ANALYSIS

PAGE

5.1 COMMERCIAL TESTING ANALYSES 161
5.2 COMBUSTIBLES ANALYSES 202
5.3 COAL SIEVE ANALYSES 204

F-464

FIELD

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

January 9, 1979

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

Sample identification by KVB

Test #2
Ohio Coal
Site-D
Taken: 7-28-78

Kind of sample reported to us: Coal

Sample taken at: -----

Sample taken by: KVB

Date sampled: -----

Date received: 12-1-78

P/O# 323-15900

Analysis report no. 71- 25726

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	2.69	xxxxx
% Ash	8.44	8.67
% Volatile	39.47	40.56
% Fixed Carbon	49.40	50.77
	100.00	100.00
Btu/lb.	13124	13487
% Sulfur	2.35	2.42

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	2.69	xxxxx
% Carbon	72.89	74.90
% Hydrogen	5.08	5.23
% Nitrogen	1.27	1.30
% Chlorine	0.13	0.13
% Sulfur	2.35	2.42
% Ash	8.44	8.67
% Oxygen(diff)	7.15	7.36
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

RAH/ br

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OFFICE TEL. (312) 264-1173

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

January 9, 1979

Sample identification by KVB

Kind of sample reported to us: Coal

Test #3
Ohio Coal
Site-D
Taken: 8-3-78

Sample taken at: -----

Sample taken by: KVB

Date sampled: -----

Date received: 12-1-78

P/O# 323-15900

Analysis report no. 71- 25729

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.37	xxxxx
% Ash	9.26	9.58
% Volatile	38.98	40.34
% Fixed Carbon	48.39	50.08
	100.00	100.00
Btu/lb.	12835	13283
% Sulfur	2.54	2.63

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.37	xxxxx
% Carbon	71.25	73.74
% Hydrogen	5.02	5.20
% Nitrogen	1.24	1.28
% Chlorine	0.12	0.12
% Sulfur	2.54	2.63
% Ash	9.26	9.58
% Oxygen(diff)	7.20	7.45
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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January 9, 1979

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

Sample identification by KVB

Test #4
Ohio Coal
Site-D
Taken: 8-15-78

Kind of sample reported to us	Coal
Sample taken at	-----
Sample taken by	KVB
Date sampled	-----
Date received	12-1-78

P/O# 323-15900

Analysis report no. 71- 25733

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.23	xxxxx
% Ash	8.08	8.35
% Volatile	39.45	40.77
% Fixed Carbon	49.24	50.88
	100.00	100.00
Btu/lb.	13081	13518
% Sulfur	2.79	2.88

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.23	xxxxx
% Carbon	72.71	75.14
% Hydrogen	5.06	5.23
% Nitrogen	1.27	1.31
% Chlorine	0.12	0.12
% Sulfur	2.79	2.88
% Ash	8.08	8.35
% Oxygen(diff)	6.74	6.97
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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January 9, 1979

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

Sample identification by KVB

Kind of sample reported to us	Coal
Sample taken at	-----
Sample taken by	KVB
Date sampled	-----
Date received	12-1-78

Test #5
Ohio Coal
Site-D
Taken: 8-16-78

P/O# 323-15900

Analysis report no. 71- 25735

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.10	xxxxx
% Ash	8.47	8.74
% Volatile	39.53	40.79
% Fixed Carbon	48.90	50.47
	100.00	100.00
Btu/lb.	13034	13451
% Sulfur	2.44	2.52

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.10	xxxxx
% Carbon	72.38	74.70
% Hydrogen	5.10	5.26
% Nitrogen	1.24	1.28
% Chlorine	0.11	0.11
% Sulfur	2.44	2.52
% Ash	8.47	8.74
% Oxygen(diff)	7.16	7.39
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

RAHouser
R. A. HOUSER, Manager, Midwest Division

RAH/ br

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OFFICE TEL. (312) 264-1173

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

January 9, 1979

Sample identification by KVB

Test #6
Ohio Coal
Site-D
Taken: 8-18-78

Kind of sample reported to us: Coal
Sample taken at: -----
Sample taken by: KVB
Date sampled: -----
Date received: 12-1-78

P/O# 323-15900

Analysis report no. 71- 25739

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.06	xxxxx
% Ash	8.83	9.11
% Volatile	39.82	41.08
% Fixed Carbon	48.29	49.81
	100.00	100.00
Btu/lb.	13034	13445
% Sulfur	2.85	2.94

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.06	xxxxx
% Carbon	72.32	74.60
% Hydrogen	4.97	5.13
% Nitrogen	1.09	1.12
% Chlorine	0.11	0.11
% Sulfur	2.85	2.94
% Ash	8.83	9.11
% Oxygen(diff)	6.77	6.99
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

RAH/ br

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OFFICE TEL. (312) 264-1173

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

January 9, 1979

Sample identification by KVB

Test #7
Ohio Coal
Site-D
Taken: 8-22-78

Kind of sample reported to us: Coal

Sample taken at: -----

Sample taken by: KVB

Date sampled: -----

Date received: 12-1-78

P/O# 323-15900

Analysis report no. 71- 25743

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.35	xxxxx
% Ash	9.00	9.31
% Volatile	39.15	40.51
% Fixed Carbon	48.50	50.18
	100.00	100.00
Btu/lb.	12978	13428
% Sulfur	2.57	2.66

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.35	xxxxx
% Carbon	71.80	74.29
% Hydrogen	5.01	5.18
% Nitrogen	1.12	1.16
% Chlorine	0.12	0.12
% Sulfur	2.57	2.66
% Ash	9.00	9.31
% Oxygen(diff)	7.03	7.28
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

Charter Member

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GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 10, 1979

Sample identification
by KVB, Inc.

Test [redacted]
Ohio Coal
Site-D
Taken 8/23/78

Kind of sample reported to us	Coal
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	8/23/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25747

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.04	xxxxx
% Ash	8.65	8.92
% Volatile	39.01	40.23
% Fixed Carbon	49.30	50.85
	100.00	100.00
Btu/lb.	13084	13494
% Sulfur	2.59	2.67

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.04	xxxxx
% Carbon	72.44	74.71
% Hydrogen	4.96	5.12
% Nitrogen	1.24	1.28
% Chlorine	0.13	0.13
% Sulfur	2.59	2.67
% Ash	8.65	8.92
% Oxygen(diff)	6.95	7.17
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser
R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

January 9, 1979

Sample identification by KVB

Test #9
Ohio Coal
Site-D
Taken: 8-29-78

Kind of sample reported to us	Coal
Sample taken at	-----
Sample taken by	KVB
Date sampled	-----
Date received	12-1-78

P/O# 323-15900

Analysis report no. 71- 25751

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.40	xxxxx
% Ash	8.24	8.53
% Volatile	39.16	40.54
% Fixed Carbon	49.20	50.93
	100.00	100.00
Btu/lb.	13068	13528
% Sulfur	2.23	2.31

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.40	xxxxx
% Carbon	72.05	74.59
% Hydrogen	5.04	5.22
% Nitrogen	1.32	1.37
% Chlorine	0.12	0.12
% Sulfur	2.23	2.31
% Ash	8.24	8.53
% Oxygen(diff)	7.60	7.86
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser
R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

January 9, 1979

Sample identification by KVB

Test #10
Ohio Coal
Site-D
Taken: 8-30-78

Kind of sample reported to us: Coal

Sample taken at: -----

Sample taken by: KVB

Date sampled: -----

Date received: 12-1-78

P/O# 323-15900

Analysis report no. 71- 25755

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.45	xxxxx
% Ash	8.13	8.42
% Volatile	39.17	40.57
% Fixed Carbon	49.25	51.01
	100.00	100.00
Btu/lb.	13019	13484
% Sulfur	2.50	2.59

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.45	xxxxx
% Carbon	72.38	74.97
% Hydrogen	5.02	5.20
% Nitrogen	1.33	1.38
% Chlorine	0.10	0.10
% Sulfur	2.50	2.59
% Ash	8.13	8.42
% Oxygen(diff)	7.09	7.34
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

January 9, 1979

Sample identification by KVB

Kind of sample reported to us	Coal
Sample taken at	-----
Sample taken by	KVB
Date sampled	-----
Date received	12-1-78

Test #12
Ohio Coal
Site-D
Taken: 9-6-78

P/O# 323-15900

Analysis report no. 71- 25759

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.50	xxxxx
% Ash	9.14	9.47
% Volatile	37.90	39.27
% Fixed Carbon	49.46	51.26
	100.00	100.00
Btu/lb.	12935	13404
% Sulfur	2.82	2.92

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	3.50	xxxxx
% Carbon	71.14	73.72
% Hydrogen	4.90	5.08
% Nitrogen	1.31	1.36
% Chlorine	0.12	0.12
% Sulfur	2.82	2.92
% Ash	9.14	9.47
% Oxygen(diff)	7.07	7.33
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

January 10, 1979

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

Sample identification
by KVB, Inc.

Test #13
Ohio Coal
Site-D
Taken 9/7/78

Kind of sample reported to us	Coal
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	9/7/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25763

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.31	xxxxx
% Ash	9.57	9.90
% Volatile	39.22	40.56
% Fixed Carbon	47.90	49.54
	100.00	100.00
Btu/lb.	12839	13278
% Sulfur	2.94	3.04

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.31	xxxxx
% Carbon	71.40	73.84
% Hydrogen	4.91	5.08
% Nitrogen	1.15	1.19
% Chlorine	0.12	0.12
% Sulfur	2.94	3.04
% Ash	9.57	9.90
% Oxygen(diff)	6.60	6.83
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 10, 1979

Sample identification
by KVB, Inc.

Test #14
Century Coal
Site-D
Taken 9/12/78

Kind of sample reported to us	Coal
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	9/12/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25767

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.09	xxxxx
% Ash	6.86	7.08
% Volatile	38.75	39.99
% Fixed Carbon	51.30	52.93
	100.00	100.00
Btu/lb.	13342	13767
% Sulfur	2.04	2.10

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	3.09	xxxxx
% Carbon	74.52	76.90
% Hydrogen	5.02	5.19
% Nitrogen	1.26	1.30
% Chlorine	0.10	0.10
% Sulfur	2.04	2.10
% Ash	6.86	7.08
% Oxygen(diff)	7.11	7.34
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

January 10, 1979

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

Sample identification by KVB, Inc.

Test #15
Century Coal
Site-D
Taken 9/13/78

Kind of sample reported to us: Coal
Sample taken at: Site-D
Sample taken by: KVB, Inc.
Date sampled: 9/13/78
Date received: 12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25771

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	2.69	xxxxx
% Ash	4.92	5.06
% Volatile	39.14	40.22
% Fixed Carbon	53.25	54.72
	100.00	100.00
Btu/lb.	13829	14211
% Sulfur	1.15	1.18

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	2.69	xxxxx
% Carbon	77.18	79.31
% Hydrogen	5.24	5.38
% Nitrogen	1.23	1.26
% Chlorine	0.13	0.13
% Sulfur	1.15	1.18
% Ash	4.92	5.06
% Oxygen(diff)	7.46	7.68
	100.00	100.00

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 10, 1979

Sample identification
by KVB, Inc.

Test #16
Century Coal
Site-D
Taken 9/13/78

Kind of sample reported to us	Coal
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	9/13/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25775

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	2.62	xxxxx
% Ash	5.89	6.05
% Volatile	37.96	38.98
% Fixed Carbon	53.53	54.97
	100.00	100.00
Btu/lb.	13622	13988
% Sulfur	1.11	1.14

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	2.62	xxxxx
% Carbon	75.62	77.65
% Hydrogen	5.14	5.28
% Nitrogen	1.32	1.36
% Chlorine	0.13	0.13
% Sulfur	1.11	1.14
% Ash	5.89	6.05
% Oxygen(diff)	8.17	8.39
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, Inc.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 10, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us: Coal
Sample taken at: -----
Sample taken by: KVB, Inc.
Date sampled: -----
Date received: 12-1-78

Test #17
Century Coal
Site-D
Taken: 9-14-78

P/O# 323-15900

Analysis report no. 71- 25777

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	2.59	xxxxx
% Ash	5.66	5.81
% Volatile	37.96	38.97
% Fixed Carbon	53.79	55.22
	100.00	100.00
Btu/lb.	13691	14055
% Sulfur	0.86	0.88

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	2.59	xxxxx
% Carbon	76.63	78.67
% Hydrogen	5.15	5.29
% Nitrogen	1.34	1.38
% Chlorine	0.15	0.15
% Sulfur	0.86	0.88
% Ash	5.66	5.81
% Oxygen(diff)	7.62	7.83
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

Charter Member

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 10, 1979

Sample identification by KVB, Inc.

Test #18
Century Coal
Site-D
Taken 9/15/78

Kind of sample reported to us	Coal
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	9/15/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25781

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	2.39	xxxxx
% Ash	5.99	6.14
% Volatile	38.39	39.33
% Fixed Carbon	53.23	54.53
	100.00	100.00
Btu/lb.	13662	13997
% Sulfur	0.98	1.00

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	2.39	xxxxx
% Carbon	76.46	78.33
% Hydrogen	5.19	5.32
% Nitrogen	1.50	1.54
% Chlorine	0.13	0.13
% Sulfur	0.98	1.00
% Ash	5.99	6.14
% Oxygen(diff)	7.36	7.54
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.
R A Houser
R. A. HOUSER, Manager, Midwest Division

Charter Member

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OFFICE TEL. (312) 264-1173

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SINCE 1908

KVB, Inc.
A Research Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

January 15, 1979

Kind of sample reported to us: Coal

Sample taken at: ——

Sample taken by: KVB, Inc.

Date sampled: ——

Date received: 12/1/78

Sample identification by KVB, Inc.

Test #22
Victoria Coal
Site D
Taken 9-21-78

P/O# 323-15900

Analysis report no. 71- 25785

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	3.05	xxxxx
% Ash	6.47	6.67
% Volatile	37.43	38.61
% Fixed Carbon	53.05	54.72
	100.00	100.00
Btu/lb.	13453	13876
% Sulfur	1.10	1.13
% Alk. as Na_2O	xxxxx	0.11

SULFUR FORMS	As received	Dry basis
% Pyritic Sulfur	0.27	0.28
% Sulfate Sulfur	0.07	0.07
% Organic Sulfur	0.76	0.78

WATER SOLUBLE ALKALIES	As received	Dry basis
% Na_2O =	xxxxx	xxxxx
% K_2O =	xxxxx	xxxxx

FUSION TEMPERATURE OF ASH		Reducing	Oxidizing
	Initial Deformation	2480 °F	2700 °F
H is Cone Height	Softening (H=W)	2700+ °F	2700+ °F
W is Cone Width	Softening (H=½W)	2700+ °F	2700+ °F
	Fluid	2700+ °F	2700+ °F

% EQUILIBRIUM MOISTURE = xxxxx

HARDGROVE GRINDABILITY INDEX = 43

FREE SWELLING INDEX = 5 1/2

% Weight ULTIMATE ANALYSIS	As received	Dry basis
Moisture	3.05	xxxxx
Carbon	75.08	77.44
Hydrogen	4.98	5.14
Nitrogen	1.27	1.31
Chlorine	0.06	0.06
Sulfur	1.10	1.13
Ash	6.47	6.67
Oxygen (diff)	7.99	8.25
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica, SiO_2	49.83
Alumina, Al_2O_3	29.97
Titania, TiO_2	1.55
Ferric oxide, Fe_2O_3	10.15
Lime, CaO	1.88
Magnesia, MgO	0.86
Potassium oxide, K_2O	1.61
Sodium oxide, Na_2O	0.54
Sulfur trioxide, SO_3	1.38
Phos. pentoxide, P_2O_5	0.36
Undetermined	1.48*
	100.00

SILICA VALUE = 79.45

BASE: ACID RATIO 0.18

T_{250} Temperature = 2765°F

*These ignited basis results were used to calculate undetermined value.

%Strontium Oxide, SrO——— 0.15
%Barium Oxide, BaO———— 0.23
%Manganese Oxide, Mn_3O_4——— 0.01

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

CTE
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KVB, Inc.
A Research Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

January 15, 1979

Kind of sample reported to us	Coal
Sample taken at	------
Sample taken by	KVB, Inc.
Date sampled	------
Date received	12/1/78

Sample identification by KVB, Inc.

Test #23
Victoria Coal
Site D
Taken 9-22-78

P/O# 323-15900

Analysis report no. 71- 25787

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	3.16	xxxxx
% Ash	6.96	7.19
% Volatile	37.06	38.27
% Fixed Carbon	52.82	54.54
	100.00	100.00
Btu/lb.	13357	13793
% Sulfur	1.11	1.15
% Alk. as Na_2O	xxxxx	0.[illegible]
SULFUR FORMS		
% Pyritic Sulfur	0.29	0.30
% Sulfate Sulfur	0.06	0.06
% Organic Sulfur	0.76	0.79
WATER SOLUBLE ALKALIES		
% Na_2O =	xxxxx	xxxxx
% K_2O =	xxxxx	xxxxx

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	2700 °F	2700+ °F
H = Cone Height Softening (H = W)	2700+ °F	2700+ °F
W = Cone Width Softening (H = ½W)	2700+ °F	2700+ °F
Fluid	2700+ °F	2700+ °F
% EQUILIBRIUM MOISTURE =	xxxxx	
HARDGROVE GRINDABILITY INDEX =	45	
FREE SWELLING INDEX =	4	

ULTIMATE ANALYSIS (% Weight)	As received	Dry basis
Moisture	3.16	xxxxx
Carbon	74.84	77.28
Hydrogen	5.02	5.18
Nitrogen	1.32	1.36
Chlorine	0.07	0.07
Sulfur	1.11	1.15
Ash	6.96	7.19
Oxygen (diff)	7.52	7.77
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica, SiO_2	50.60
Alumina, Al_2O_3	31.28
Titania, TiO_2	1.55
Ferric oxide, Fe_2O_3	9.39
Lime, CaO	1.91
Magnesia, MgO	0.72
Potassium oxide, K_2O	1.71
Sodium oxide, Na_2O	0.42
Sulfur trioxide, SO_3	*0.96
Phos. pentoxide, P_2O_5	0.70
Undetermined	0.35
	100.00
SILICA VALUE =	80.80
BASE: ACID RATIO	0.17
T_{250} Temperature =	2785°F

*These ignited basis results were used to calculate undetermined value.
%Strontium Oxide, SrO———— 0.17
%Barium Oxide, BaO———— 0.23
%Manganese Oxide, Mn_3O_4———— 0.01

RAH:br

Respectfully submitted,
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GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

SINCE 1908

January 15, 1979

KVB, Inc.
A Research Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

Sample identification by KVB, Inc.

Composite
Century Coal
Site D
Taken 9-18-78

P/O# 323-15900

Kind of sample reported to us	Coal
Sample taken at	——
Sample taken by	KVB, Inc.
Date sampled	——
Date received	12/1/78

Analysis report no. 71- 25788

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	2.94	xxxxx
% Ash	5.46	5.63
% Volatile	38.79	39.96
% Fixed Carbon	52.81	54.41
	100.00	100.00
Btu/lb.	13709	14124
% Sulfur	1.00	1.03
% Alk. as Na_2O	xxxxx	0.11

SULFUR FORMS	As received	Dry basis
% Pyritic Sulfur	0.19	0.20
% Sulfate Sulfur	0.02	0.02
% Organic Sulfur	0.79	0.81

WATER SOLUBLE ALKALIES	As received	Dry basis
% Na_2O =	xxxxx	xxxxx
% K_2O =	xxxxx	xxxxx

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	2680 °F	2700+ °F
Softening (H=W)	2700+ °F	2700+ °F
Softening (H=½W)	2700+ °F	2700+ °F
Fluid	2700+ °F	2700+ °F

H is Cone Height
W is Cone Width

% EQUILIBRIUM MOISTURE = xxxxx
HARDGROVE GRINDABILITY INDEX = 40
FREE SWELLING INDEX = 3

ULTIMATE ANALYSIS	% Weight As received	% Weight Dry basis
Moisture	2.94	xxxxx
Carbon	76.65	78.97
Hydrogen	5.18	5.34
Nitrogen	1.32	1.36
Chlorine	0.04	0.04
Sulfur	1.00	1.03
Ash	5.46	5.63
Oxygen (diff)	7.41	7.63
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basi
Silica, SiO_2	47.07
Alumina, Al_2O_3	32.71
Titania, TiO_2	1.42
Ferric oxide, Fe_2O_3	9.24
Lime, CaO	2.23
Magnesia, MgO	1.10
Potassium oxide, K_2O	1.99
Sodium oxide, Na_2O	0.63
Sulfur trioxide, SO_3	1.85
Phos. pentoxide, P_2O_5	0.32
Undetermined	0.92
	100.00

SILICA VALUE = 78.92
BASE: ACID RATIO 0.19
T_{250} Temperature = 2730°F

*These ignited basis results were used to calculate undetermined value.
%Strontium Oxide, SrO——— 0.23
%Barium Oxide, BaO——— 0.28
%Manganese Oxide, Mn_3O_4——— 0.01

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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COMMERCIAL TESTING & ENGINEERING CO.
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
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OFFICE TEL. (312) 264-1173

CTE
SINCE 1908

January 15, 1979

KVB, Inc.
A Research Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

Kind of sample reported to us	Coal
Sample taken at	——
Sample taken by	KVB, Inc.
Date sampled	——
Date received	12/1/78

Sample identification by KVB, Inc.

Composite
Perfect 8 Coal (Ohio Coal)
Site D
Taken 9-20-78

P/O# 323-15900

Analysis report no. 71- 25789

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	2.77	xxxxx
% Ash	8.97	9.23
% Volatile	38.25	39.34
% Fixed Carbon	50.01	51.43
	100.00	100.00
Btu/lb.	12945	13314
% Sulfur	2.73	2.81
% Alk. as Na_2O	xxxxx	0.15
SULFUR FORMS		
% Pyritic Sulfur	1.46	1.50
% Sulfate Sulfur	0.12	0.12
% Organic Sulfur	1.15	1.19
WATER SOLUBLE ALKALIES		
% Na_2O =	xxxxx	xxxxx
% K_2O =	xxxxx	xxxxx

FUSION TEMPERATURE OF ASH	Reducing		Oxidizing	
Initial Deformation	2050	°F	2420	°F
H is Cone Height — Softening (H=W)	2320	°F	2550	°F
W is Cone Width — Softening (H=½W)	2380	°F	2590	°F
Fluid	2520	°F	2680	°F

% EQUILIBRIUM MOISTURE = xxxxx
HARDGROVE GRINDABILITY INDEX = 47
FREE SWELLING INDEX = 4

ULTIMATE ANALYSIS	% Weight As received	% Weight Dry basis
Moisture	2.77	xxxxx
Carbon	72.04	74.09
Hydrogen	4.89	5.03
Nitrogen	1.42	1.46
Chlorine	0.09	0.09
Sulfur	2.73	2.81
Ash	8.97	9.23
Oxygen (diff)	7.09	7.29
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica, SiO_2	45.24
Alumina, Al_2O_3	23.83
Titania, TiO_2	1.18
Ferric oxide, Fe_2O_3	24.72
Lime, CaO	1.04
Magnesia, MgO	0.62
Potassium oxide, K_2O	1.82
Sodium oxide, Na_2O	0.42
Sulfur trioxide, SO_3	0.62
Phos. pentoxide, P_2O_5	0.13
Undetermined	0.25
	100.00
SILICA VALUE =	63.17
BASE: ACID RATIO	0.41
T_{250} Temperature =	2400°F

*These ignited basis results were used to calculate undetermined value.
%Strontium Oxide, SrO———— 0.04
%Barium Oxide, BaO———— 0.07
%Manganese Oxide, Mn_3O_4———— 0.02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

LAHouser
R. A. HOUSER, Manager, Midwest Division

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PLEASE ADDRESS ALL CORRESPONDENCE TO:
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Ash	Test #2 Site-D Taken 7/28/78
Sample taken at	Site-D	
Sample taken by	KVB, Inc.	
Date sampled	7/28/78	
Date received	12/1/78	P. O. No. 323-15900

Analysis report no. 71- 25724, 25725

	Boiler Hopper	Dust Collector	Bottom Ash
		DRY BASIS	
% Combustible	-----	16.93	14.89

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification
by KVB, Inc.

Test #3
Site-D
Taken 8/3/78

Kind of sample reported to us	Ash
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	8/3/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25727, 25728

DRY BASIS

	Boiler Hopper	Dust Collector	Bottom Ash
% Combustible	-----	11.93	33.10

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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SINCE 1908

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification by KVB, Inc.

Test #4
Site-D
Taken 8/15/78

Kind of sample reported to us	Ash
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	8/15/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25730, 25731, 25732

DRY BASIS

	Boiler Hopper	Dust Collector	Bottom Ash
% Combustible	12.31	11.10	19.39

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification by KVB, Inc.

Test #5
Site-D
Taken 8/16/78

Kind of sample reported to us	Ash
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	8/16/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25734

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	-----	-----	15.05

Respectfully submitted,
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SINCE 1908

KVB
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 55426

December 8 1978

Sample identification
by KVB

Kind of sample reported to us	Ash
Sample taken at	xxxxx
Sample taken by	KVB
Date sampled	xxxxx
Date received	11-20 78

Test #5
Boiler Hopper Ash
Test Site: D
Date Taken 8-16-78

Analysis report no. 71- 23384

	Dry Basis
% Ash	82.46
% Combustible	17.54

WET SIEVE TEST

Passing	Retained On	% Weight
	30M	13.9
30M	50	33.0
50	100	28.0
100	200	11.6
200	325	4.6
325	0	8.9
		100.0

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Ash	Test #6 Site-D Taken 8/18/78
Sample taken at	Site-D	
Sample taken by	KVB, Inc.	
Date sampled	8/18/78	
Date received	12/1/78	P. O. No. 323-15900

Analysis report no. 71- 25736, 25737, 25738

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	8.93	13.58	17.49

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification
by KVB, Inc.

Test #7
Site-D
Taken 8/22/78

Kind of sample reported to us	Ash
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	8/22/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25740, 25741, 25742

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	11.84	10.72	19.58

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification
by KVB, Inc.

Kind of sample reported to us	Ash	Test #8 Site-D Taken 8/23/78
Sample taken at	Site-D	
Sample taken by	KVB, Inc.	
Date sampled	8/23/78	
Date received	12/1/78	P. O. No. 323-15900

Analysis report no. 71- 25744, 25745, 25746

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	11.12	8.90	20.73

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification by KVB, Inc.

Test #9
Site-D
Taken 8/29/78

Kind of sample reported to us	Ash
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	8/29/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25748, 25749, 25750

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	0.00	17.46	11.80

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification by KVB, Inc.

Test #10
Site-D
Taken 8/30/78

Kind of sample reported to us: Ash

Sample taken at: Site-D

Sample taken by: KVB, Inc.

Date sampled: 8/30/78

Date received: 12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25752, 25753, 25754

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	3.59	6.06	8.39

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification by KVB, Inc.

Test #12
Site-D
Taken 9/6/78

Kind of sample reported to us: Ash
Sample taken at: Site-D
Sample taken by: KVB, Inc.
Date sampled: 9/6/78
Date received: 12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25756, 25757, 25758

DRY BASIS

	Boiler Hopper	Dust Collector	Bottom Ash
% Combustible	3.88	8.86	18.72

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 1[illegible], 1979

Sample identification
by KVB, Inc.

Test #13
Site-D
Taken 9/7/78

Kind of sample reported to us	Ash
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	9/7/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25760, 25761, 25762

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	6.60	8.85	22.55

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

Sample identification by KVB, Inc.

Test #14
Site-D
Taken 9/12-78

Kind of sample reported to us Ash

Sample taken at Site-D

Sample taken by KVB, Inc.

Date sampled 9/12/78

Date received 12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25764, 25765, 25766

DRY BASIS

	Boiler Hopper	Dust Collector	Bottom Ash
% Combustible	16.07	11.40	15.28

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

RAHouser

R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification by KVB, Inc.

Test #15
Site-D
Taken 9/13-78

Kind of sample reported to us	Ash
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	9/13/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25768, 25769, 25770

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	18.73	16.32	11.48

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

January 11, 1979

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

Sample identification by KVB, Inc.

Test #16
Site-D
Taken 9/13-78

Kind of sample reported to us: Ash

Sample taken at: Site-D

Sample taken by: KVB, Inc.

Date sampled: 9/13/78

Date received: 12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25772, 25773, 25774

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	17.94	9.74	15.02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

CTE
SINCE 1908

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Ash	Test #17 Site-D Taken 9/14-78
Sample taken at	Site-D	
Sample taken by	KVB, Inc.	
Date sampled	9/14/78	
Date received	12/1/78	P. O. No. 323-15900

Analysis report no. 71- 25776

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	-----	-----	15.93

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

RAH br

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Charter Member

F-464

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 55426

December 8 1978

Sample identification
by KVB

Kind of sample reported to us	Ash
Sample taken at	xxxxx
Sample taken by	KVB
Date sampled	xxxxx
Date received	11-20 78

Test #17
Boiler Hopper Ash
Test Site: D
Date Taken 9-14-78

Analysis report no. 71- 23385

	Dry Basis
% Ash-----------------------------------	96.70
% Combustible---------------------------	3.30

WET SIEVE TEST

Passing	Retained On	% Weight
	30M	14.3
30M	50	39.1
50	100	27.3
100	200	11.7
200	325	2.9
325	0	4.7
		100.0

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

197 RAHouser

R. A. HOUSER, Manager, Midwest Division

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COMMERCIAL TESTING & ENGINEERING CO.
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Ash	Test #18 Site-D Taken 9/15/78
Sample taken at	Site-D	
Sample taken by	KVB, Inc.	
Date sampled	9/15/78	
Date received	12/1/78	P. O. No. 323-15900

Analysis report no. 71- 25778, 25779, 25780

DRY BASIS

	Boiler Hopper	Dust Collector	Bottom Ash
% Combustible	40.88	14.85	21.31
% Sulfur	0.40	0.62	0.16

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

CTE
SINCE 1908

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification
by KVB, Inc.

Test #22
Site-D
Taken 9/21/78

Kind of sample reported to us	Ash
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	9/21/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25782, 25783, 25784

DRY BASIS

	Boiler Hopper	Dust Collector	Bottom Ash
% Combustible	20.90	10.81	33.73
% Sulfur	0.29	0.47	0.16

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R A Houser

R. A. HOUSER, Manager, Midwest Division

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16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB
Shelard Tower, Ste. 1375
600 S. County Road 18
Minneapolis, MN 55426

December 8, 1978

Sample identification by KVB

Test #23
Boiler Hopper Ash
Test Site: D
Date Taken: 9-22-78

Kind of sample reported to us	Ash
Sample taken at	xxxxx
Sample taken by	KVB
Date sampled	xxxxx
Date received	11-20-78

Analysis report no. 71- 23386

	Dry Basis
% Ash------------------------------------	95.20
% Combustible----------------------------	4.80

WET SIEVE TEST

Passing	Retained On	% Weight
	30M	17.1
30M	50	30.8
50	100	33.3
100	200	11.6
200	325	4.7
325	0	2.5
		100.0

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

January 11, 1979

Sample identification
by KVB, Inc.

Test #23
Site-D
Taken 9/22/78

Kind of sample reported to us	Ash
Sample taken at	Site-D
Sample taken by	KVB, Inc.
Date sampled	9/22/78
Date received	12/1/78

P. O. No. 323-15900

Analysis report no. 71- 25786

	Boiler Hopper	Dust Collector	Bottom Ash
	DRY BASIS		
% Combustible	-----	-----	35.93

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

RAH br

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R A Houser

R. A. HOUSER, Manager, Midwest Division

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CARBON ANALYSIS

Crucible Number	Sample Origin	Crucible Weight	Crucible + Sample Wt. Post 110°C	Sample Weight	Post 750°C	Δ Weight	COMB %	Post 950°C Weight	Δ Weight	% Volatiles	Fixed Carbon FC= 100-%V-%A
1	TEST#3 BLROUT Side D	3.6809 3 6811 — 3.6810	3.8833 3.8831 — 3.8832	.2022	3.8121 3.8121 — 3.8121	.0711	35.2				
2	TEST#4 BLROUT Side D	3 9729 3 9731 — 3 9730	4.4022 4.4025 — 4.4023	.4293	4.3004 4.3003 — 4.3003	.1020	23.7				
3	TEST#5 BLROUT Side D	3.6686 3.6688 — 3 6687	4.5855 4.5860 — 4.5857	.9170	4.3216 4.3215 — 4.3215	.2642	28.8				
4	TEST#5 MECH Side D	3.7109 3.7110 — 3.7110	3.8369 3.8372 — 3.8370	.1260	3.8011 3.8011 — 3.8011	.0359	28.4				
6	TEST#6 BLROUT Side D	3 7398 3 7398 — 3 7399	4.6568 4.6569 — 4.6568	.9170	4.4552 4.4553 — 4.4552	.2016	21.9				
7	TEST#7 BLROUT Side D	3 7838 3 7839 — 3 7838	5.0611 5.0613 — 5.0612	1.2774	4.8565 4.8567 — 4.8566	.2046	16.0				
8	TEST#8 BLROUT Side D	3.8305 3 8305 — 3 8305	4 9416 4.9420 — 4.9419	1.1113	4 7104 4.7104 — 4 7104	.2314	20.8				
11	TEST#9 BLROUT Side D	3 7117 3.7117 — 3 7117	4.0077 4.0079 — 4.0078	.2961	3.9650 3 9649 — 3.9649	.0429	14.4				
12	TEST#12 BLROUT Side D	3.9454 3.9455 — 3.9454	4.9036 4.9039 — 4.9037	.9583	4.7665 4.7664 — 4.7664	.1373	14.3				

CARBON AN. SIS

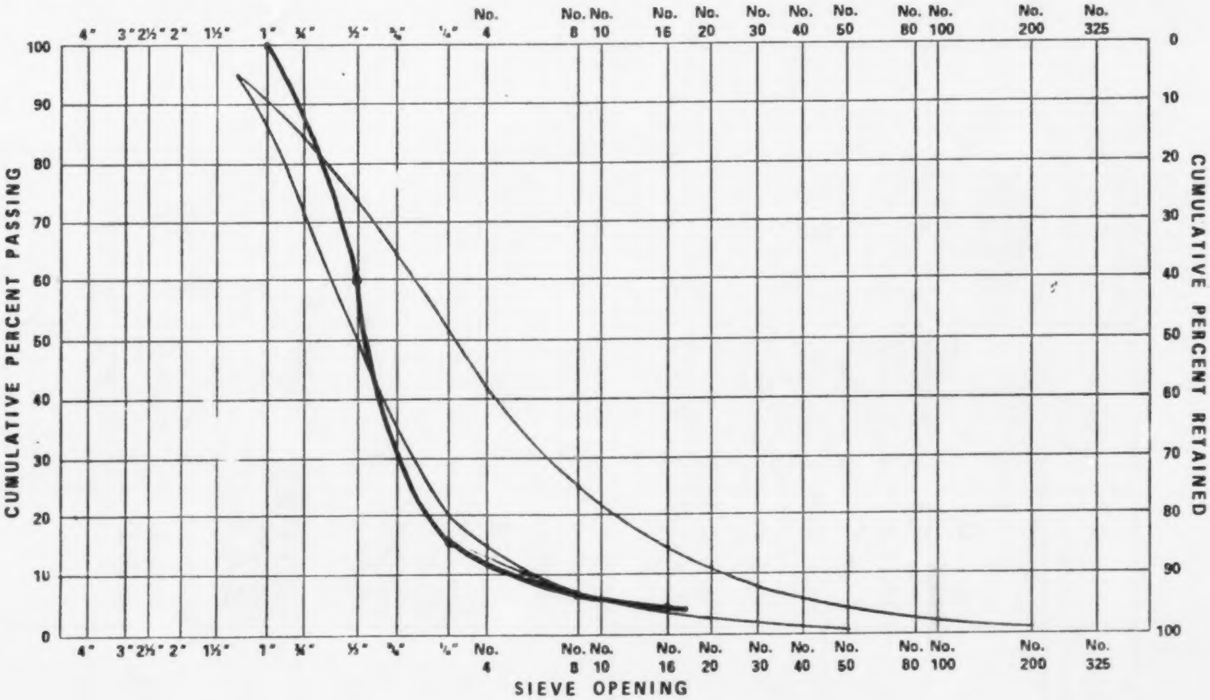
Crucible Number	Sample Origin	Crucible Weight	Crucible + Sample Wt. Post 110°C	Sample Weight	Post 750°C	Δ Weight	COMB %	Post 950°C Weight	Δ Weight	% Volatiles	Fixed Carbon FC= 100-%V-%A
1	BLR out TEST #12 Side D	3.6812 3.6811 — 3.6811	4.6082 4.6083 — 4.6082	.9271	4.4032 4.4034 — 4.4033	.2049	22.1				
2	TEST #13 BLR out Side D	3.9729 3.9727 — 3.9728	4.6592 4.6591 — 4.6591	.6863	4.4653 4.4653 — 4.4653	.1938	28.2				
3	TEST #14 BLR out Side D	3.6689 3.6687 — 3.6688	4.5391 4.5390 — 4.5390	.8702	4.1898 4.1899 — 4.1899	.3491	40.1				
4	TEST #15 BLR out Side D	3.7109 3.7106 — 3.7107	4.8328 4.8329 — 4.8328	1.1221	4.5676 4.5677 — 4.5676	.2652	23.6				
6	TEST #16 BLR out Side D	3.7400 3.7398 — 3.7399	4.3816 4.3817 — 4.3816	.6417	4.2150 4.2150 — 4.2150	.1666	25.9				
7	TEST #17 BLR out Side D	3.7836 3.7836 — 3.7836	4.7943 4.7948 — 4.7945	1.0109	4.4829 4.4831 — 4.4830	.3115	30.8				
8	TEST #17 MECH Side D	3.8304 3.8305 — 3.8304	3.8727 3.8729 — 3.8728	.0424	3.8610 3.8611 — 3.8610	.0118	27.8				
11	TEST #18 BLR out Side D	3.7119 3.7114 — 3.7117	4.5308 4.5309 — 4.5308	.8191	4.3008 4.3010 — 4.3009	.2299	28.1				
12	TEST #18 MECH Side D	3.9452 3.9452 — 3.9452	3.9968 3.9972 — 3.9970	.0518	3.9826 3.9827 — 3.9826	.0144	27.7				

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 2
DATE SAMPLE TAKEN 7-28-78
TEST SITE D
TEST PERFORMED BY VOB
SAMPLE IDENTIFICATION Ohio Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.7	145.6	34.9	0.5	7155.1	100.0	1
1"	↓	1171.7 1313.4 711.9	2864.9	40.0	7120.2	99.5	2
½"		1173.2 1147.0 1182.7	3170.8	44.3	4255.3	59.5	4
¼"		229.6 621.7	629.9	8.8	10845	15.2	7
#8		280.5	169.8	2.4	454.6	6.4	11
#16		355.5	284.8	4.0	284.8	4.0	11



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SIEVE ANALYSIS TEST REPORT

TEST NO. 3

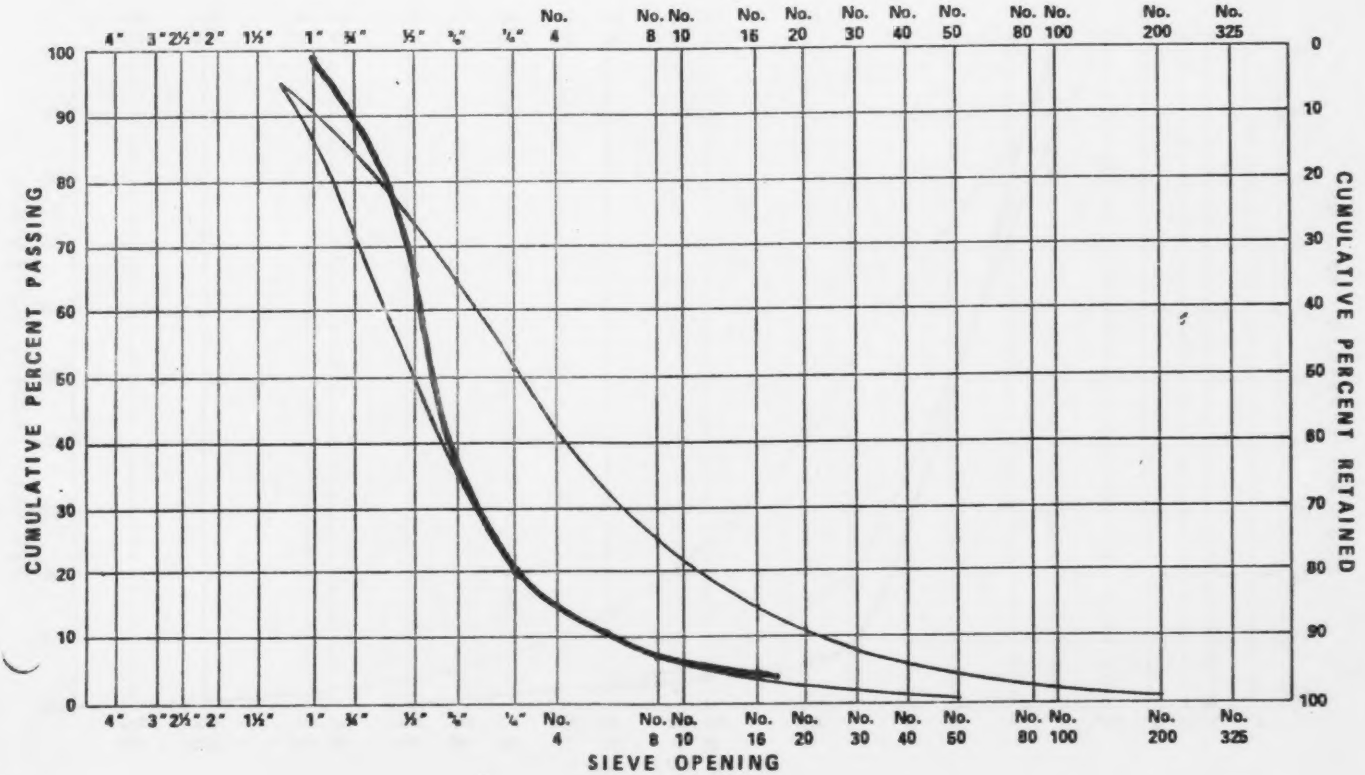
DATE SAMPLE TAKEN 8-3-78

TEST SITE D

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Ohio Coal

Screen Size: Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.8	1832 157.5	119.1	1.6	7429.9	100.0	1
1"		1317.3 1323.3	2419.0	32.6	7310.8	98.4	2
1/2"		1421.8 1133.6 1171.5	3394.5	45.7	4891.8	65.8	4
1/4"		254.0 844.6	927.0	12.5	1497.3	20.1	7
#8		1221 348.3	242.8	3.3	570.3	7.6	11
#16		438.3	327.5	4.4	327.5	4.3	11



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SIEVE ANALYSIS TEST REPORT

TEST NO. 4

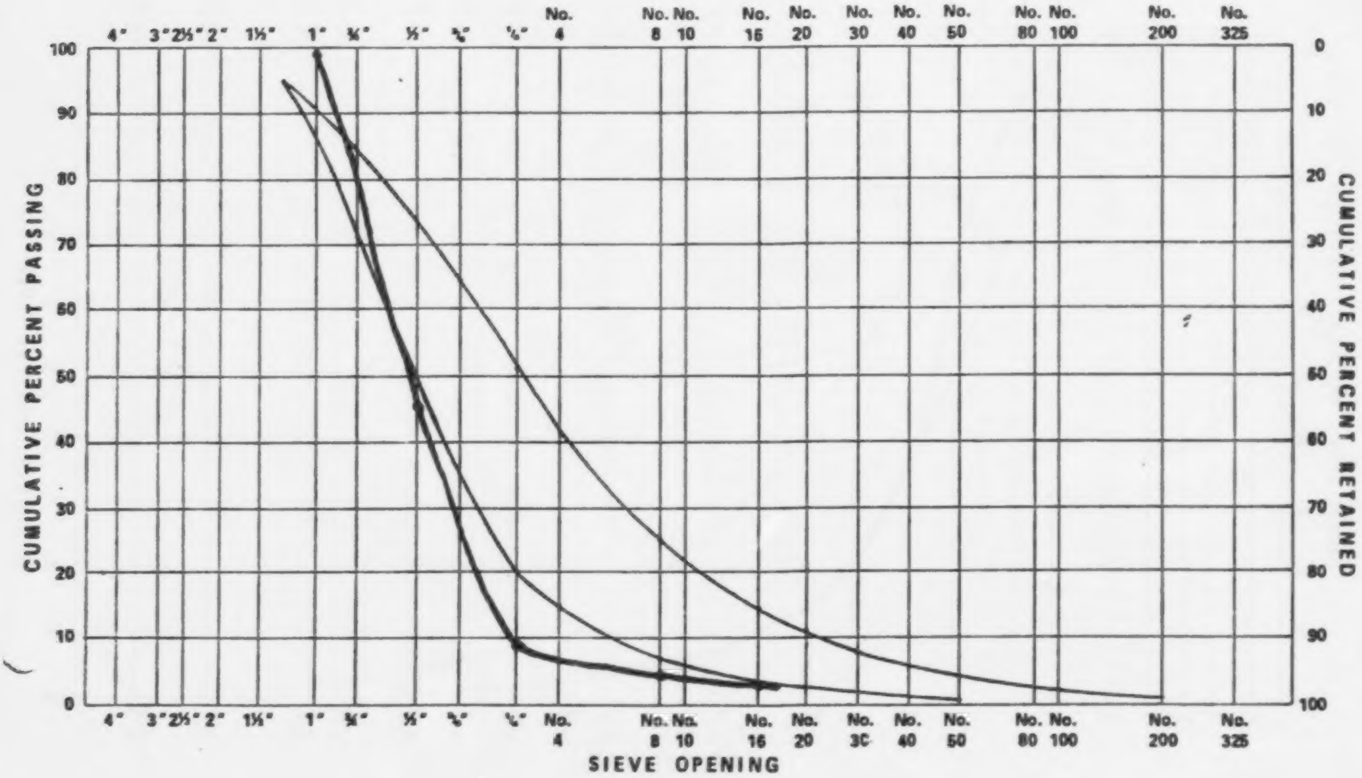
DATE SAMPLE TAKEN 8-15-78

TEST SITE D

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Ohio Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.2	173.7 124.2	77.5	1.0	7552.6	100.0	1
1"	1355.7	1329.8 1754.6	4050.5	53.6	7475.1	99.0	2
1/2"		1472.4 1495.9	2747.9	36.4	3424.6	45.4	4
1/4"		232.9 361.0	373.5	4.9	676.7	9.0	7
#8		153.1 134.8	67.5	.9	303.2	4.1	11
#16		345.9	235.7	3.1	235.7	3.2	11



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SIEVE ANALYSIS TEST REPORT

TEST NO. 5

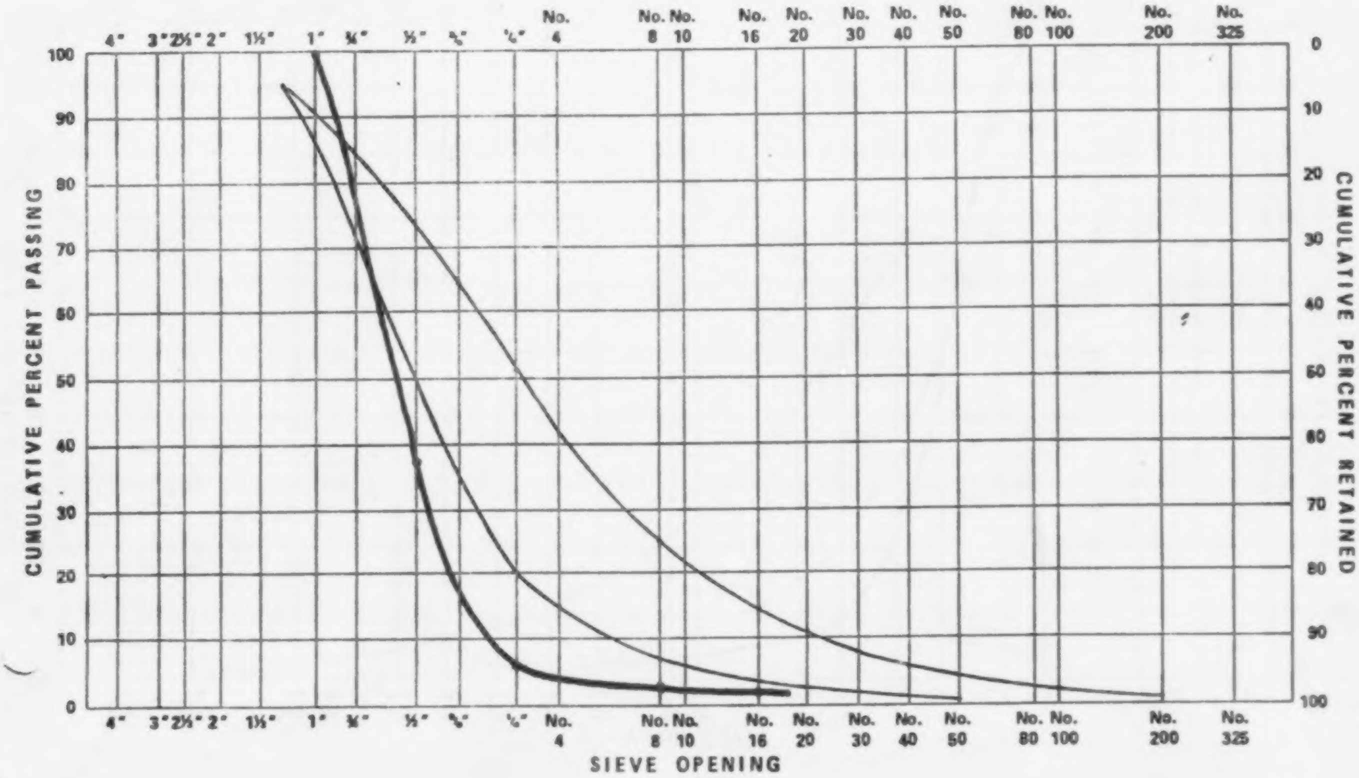
DATE SAMPLE TAKEN 8-16-78

TEST SITE D

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Ohio Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.1	120.2	10.1	0.2	6460.8	100.0	1
1"	910.1 1190.8	1129.9 1313.4	4103.8	63.5	6450.7	99.8	2
½"		11944 1015.4	1989.6 [redacted]	30.8	2346.9	36.3	4
# ¼"		201.2 196.0	177.0	2.7	357.3	5.5	7
# 8		125.2 125.2	30.2	0.5	180.3	2.8	11
# 16		260.2	150.1	2.3	150.1	2.3	11



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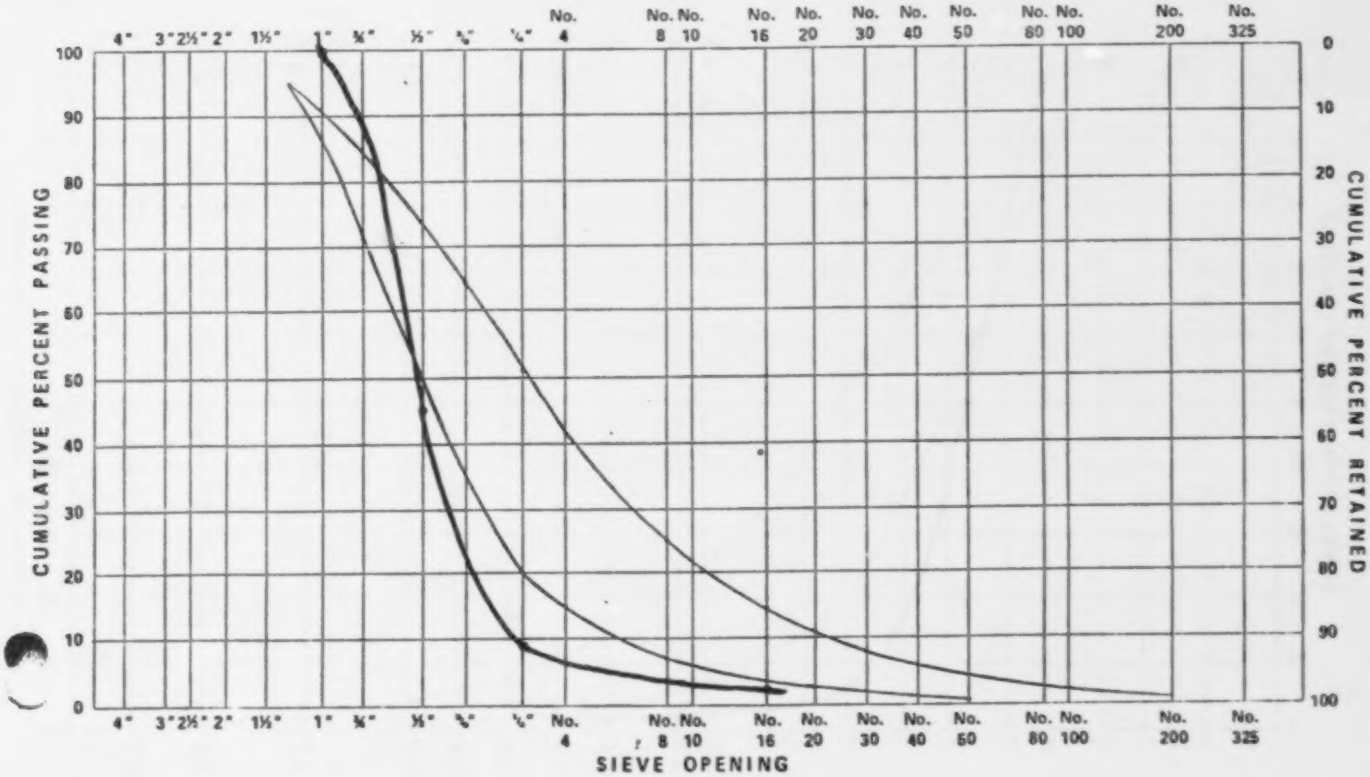
KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 6
TEST SITE D
SAMPLE IDENTIFICATION Ohio Coal

DATE SAMPLE TAKEN 8-18-78
TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	111.1	125.3	14.2	0.2	7551.3	100.0	1
1"	↓ 645.4	1235.6 1257.2 1360.7	4064.7	53.8	7537.1	99.8	2
½"		1258.3 1195.0 7126	2826.6	37.4	3472.4	46.0	4
¼"		210.2 397.0	385.0	5.1	645.8	8.6	7
#8		124.0 160.7	62.5	0.8	260.8	3.5	11
#16		309.4	198.3	2.6	198.3	2.7	11



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SIEVE ANALYSIS TEST REPORT

TEST NO. 7

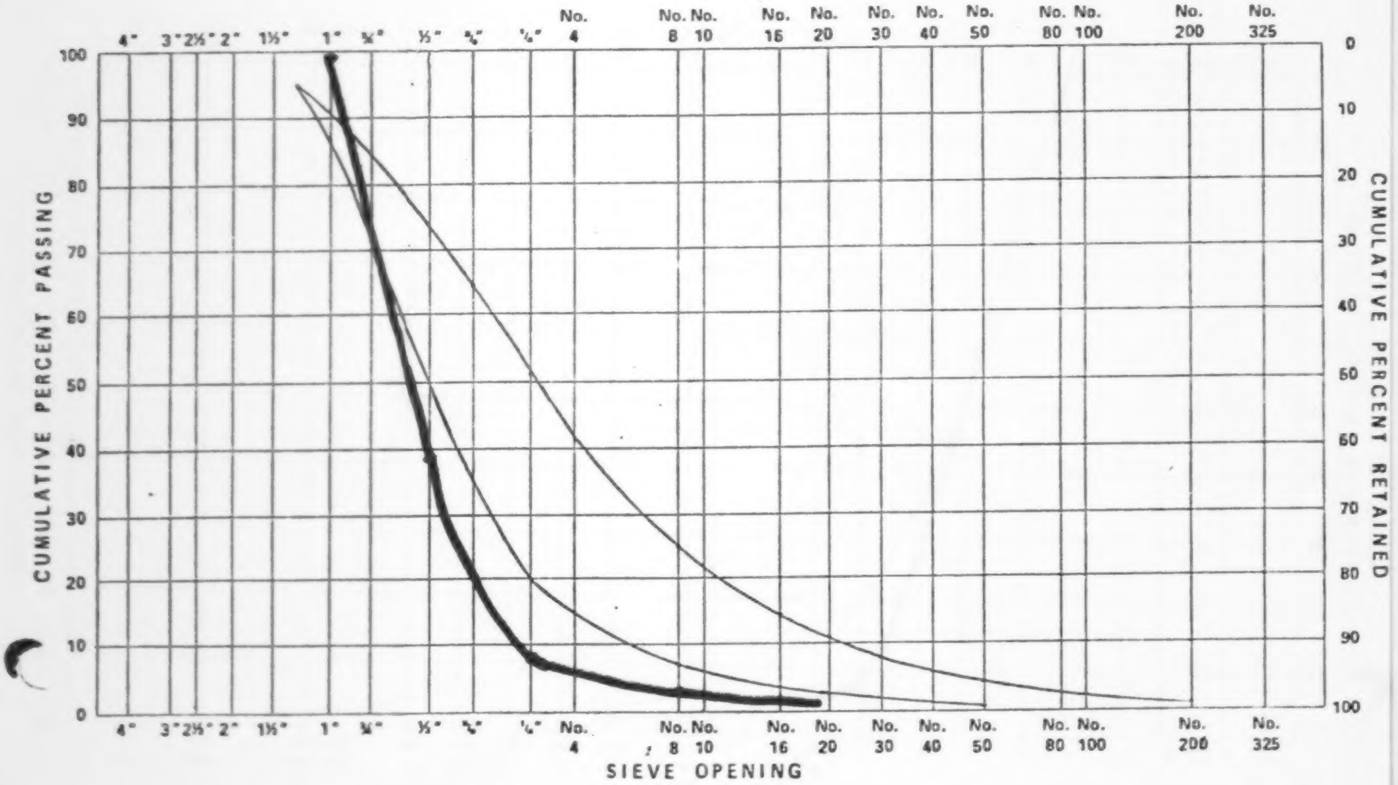
DATE SAMPLE TAKEN 8-22-78

TEST SITE D

TEST PERFORMED BY J•B

SAMPLE IDENTIFICATION Ohio Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	168.8	58.8	0.8	7203.3	100.0	3
1"	↓	1484.8 1497.9 1692.6	4345.3	60.3	7144.5	99.2	3
1/2"	↓	1241.2 1442.7	2463.9	34.2	2799.2	38.9	3
1/4"	↓	276.3	166.3	2.3	335.3	4.7	3
#8	↓	136.0	26.0	0.4	169.0	2.4	3
#16	↓	253.0	143.0	2.0	143.0	2.0	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 8

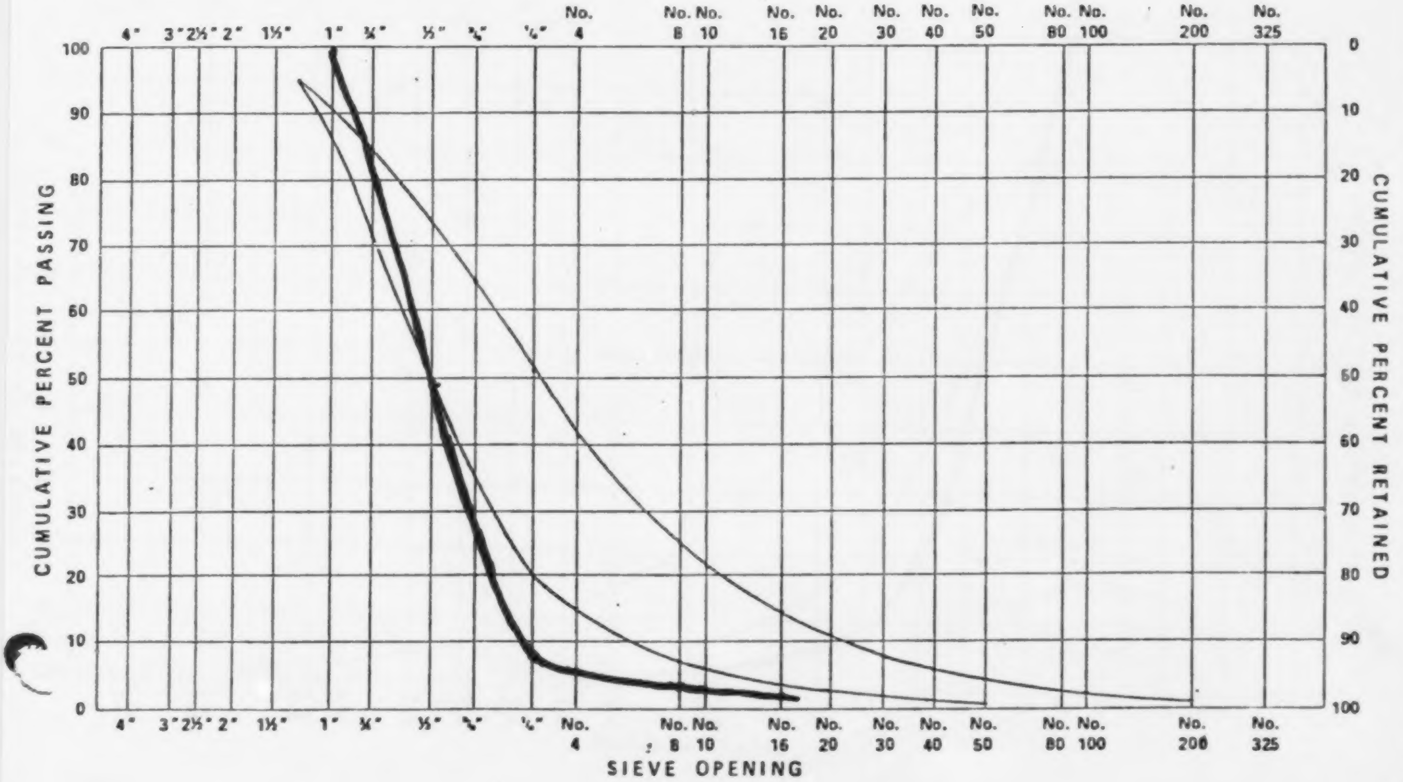
DATE SAMPLE TAKEN 8-23-78

TEST SITE D

TEST PERFORMED BY JoB

SAMPLE IDENTIFICATION Ohio

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.9	128.5	18.6	0.2	8566.7	100.0	3
1"	↓	1529.7 1691.8 1359.9	4250.8	50.8	8348.1	99.8	3
½"		1793.6 1287.7 720.3	3471.9	41.5	4097.3	49.0	3
¼"		445.8	335.9	4.0	625.4	7.5	3
#8		181.8	71.9	0.9	289.5	3.5	3
#16	↓	327.5	217.6	2.6	217.6	2.6	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 9

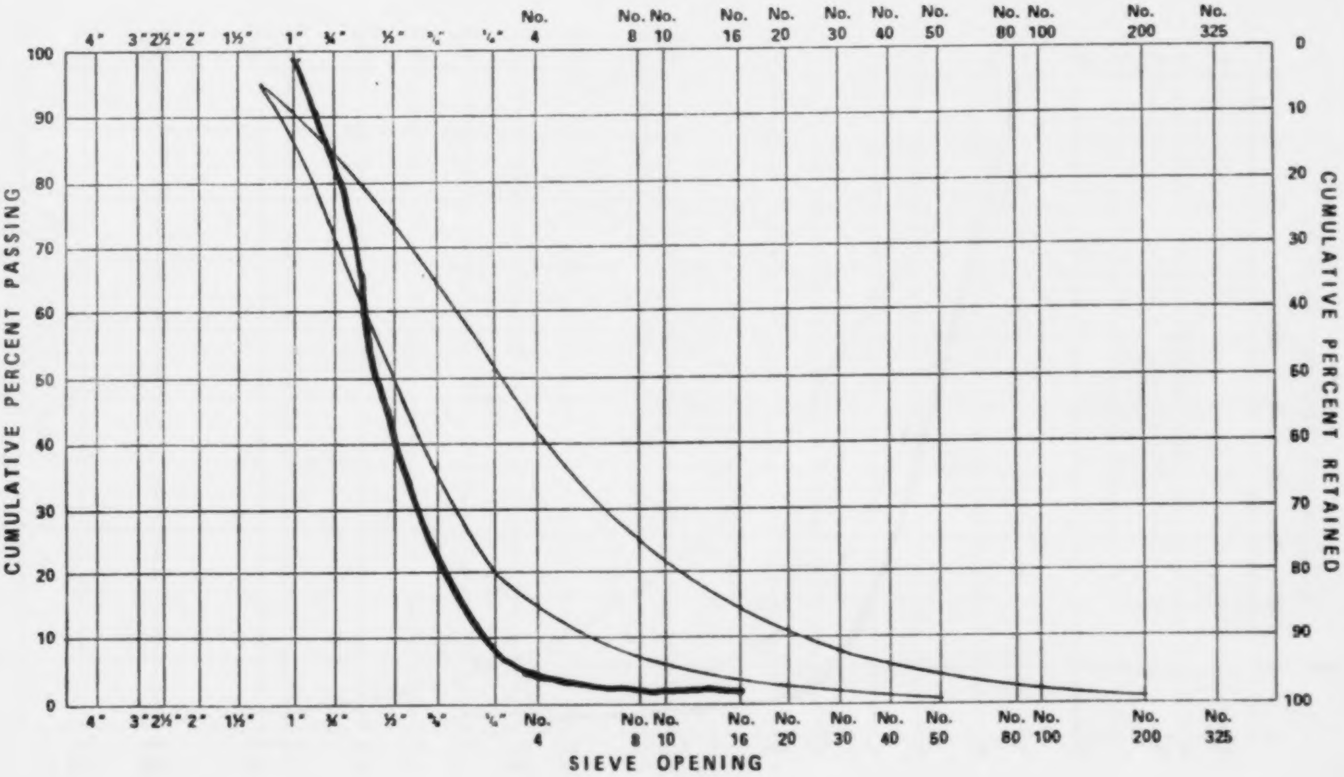
DATE SAMPLE TAKEN 8-29-78

TEST SITE D

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Ohio Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.6	229.0	119.4	1.7	7127.5	100.0	3
1"		1625.4 1373.9 1585.5	4256.0	59.7	7008.1	98.3	3
1/2"		1390.0 1078.2	2249.0	31.6	2752.1	38.6	3
1/4"		332.9	223.3	3.1	503.1	7.0	3
#8		170.4	60.8	0.9	279.8	3.9	3
#16	↓	328.6	219.0	3.1	219.0	3.0	3

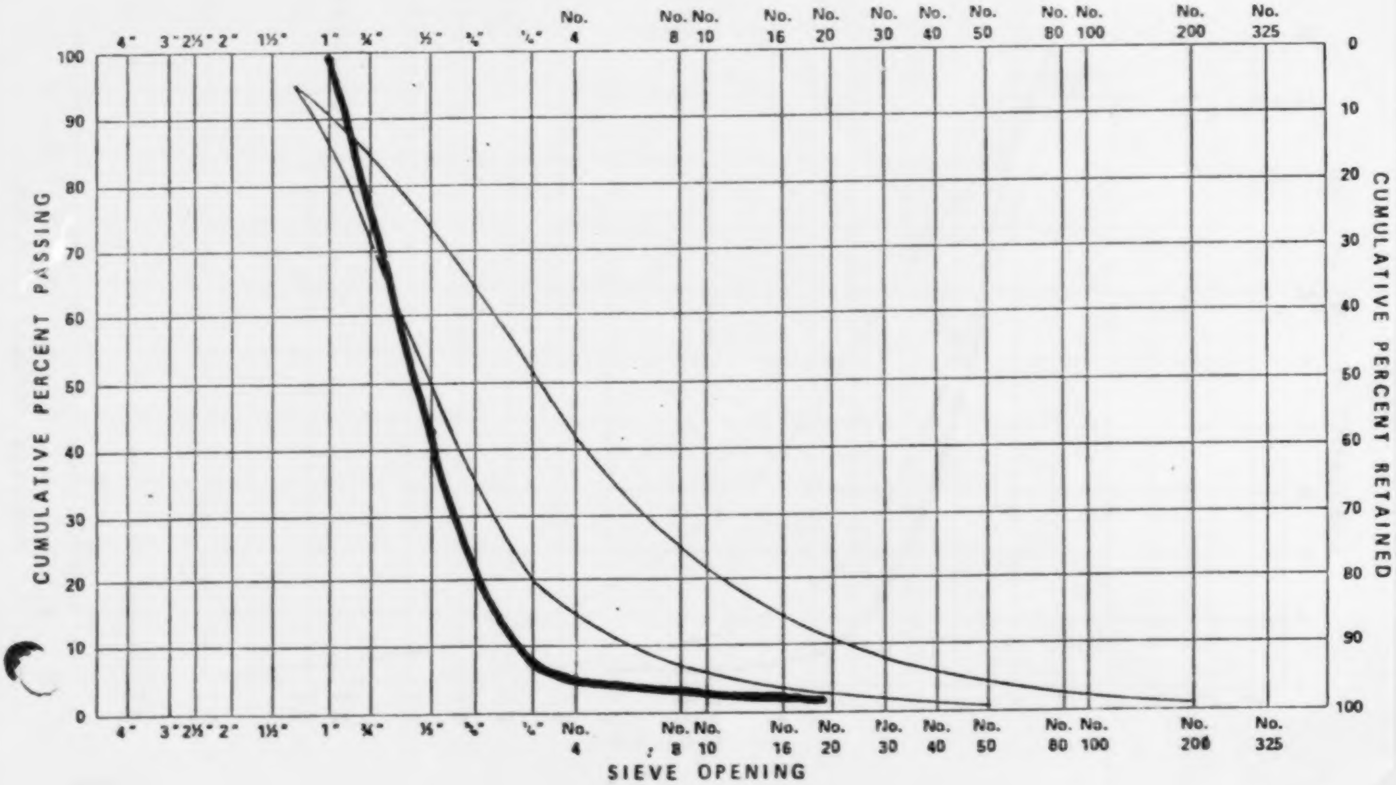


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 10
DATE SAMPLE TAKEN 8-30-78
TEST SITE D
TEST PERFORMED BY JOB
SAMPLE IDENTIFICATION Ohio

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.7	194.0	84.3	1.0	8294.4	100.0	3
1"	↓	1651.6 1689.0 1629.1	4640.6	55.9	8210.1	99.0	3
½"	↓	1590.2 1670.2	3041.0	36.7	3569.5	43.1	3
¼"	↓	357.6	247.9	3.0	528.5	6.4	3
#8	↓	171.8	62.1	0.7	280.6	3.4	3
#16	↓	328.2	219.5	2.6	218.5	2.7	3

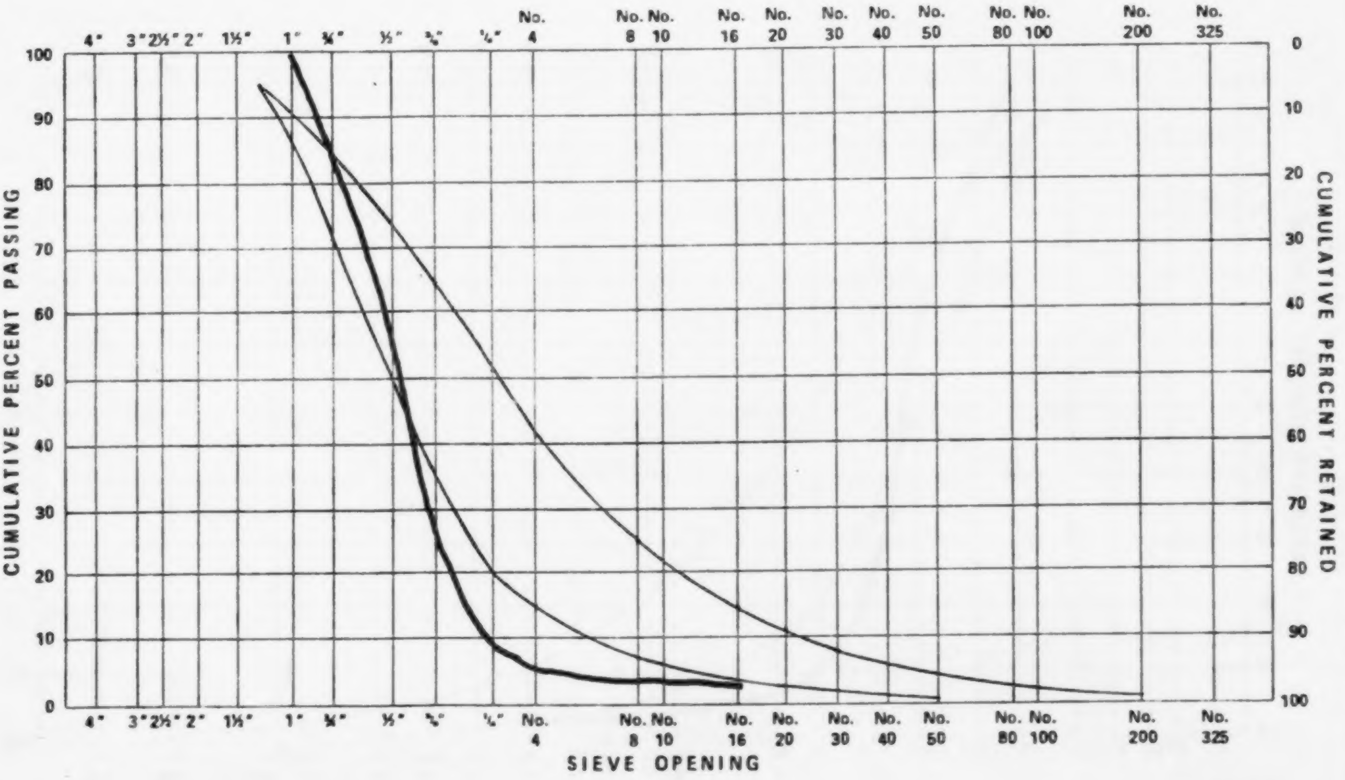


KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 12
DATE SAMPLE TAKEN 9-6-78
TEST SITE D
TEST PERFORMED BY SOB
SAMPLE IDENTIFICATION Ohio Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.7	124.7	15.0	0.2	6970.6	100.0	3
1"	↓	1575.6 1485.1 449.3	3180.9	45.6	6955.6	99.8	3
1/2"		1462.7 1114.5 906.3	3154.4	45.2	3774.7	54.2	3
1/4"		491.5	381.8	5.5	620.3	9.0	3
#8		184.5	74.8	1.1	238.5	3.5	3
#16		273.4	163.7	2.3	163.7	2.4	3



15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 13

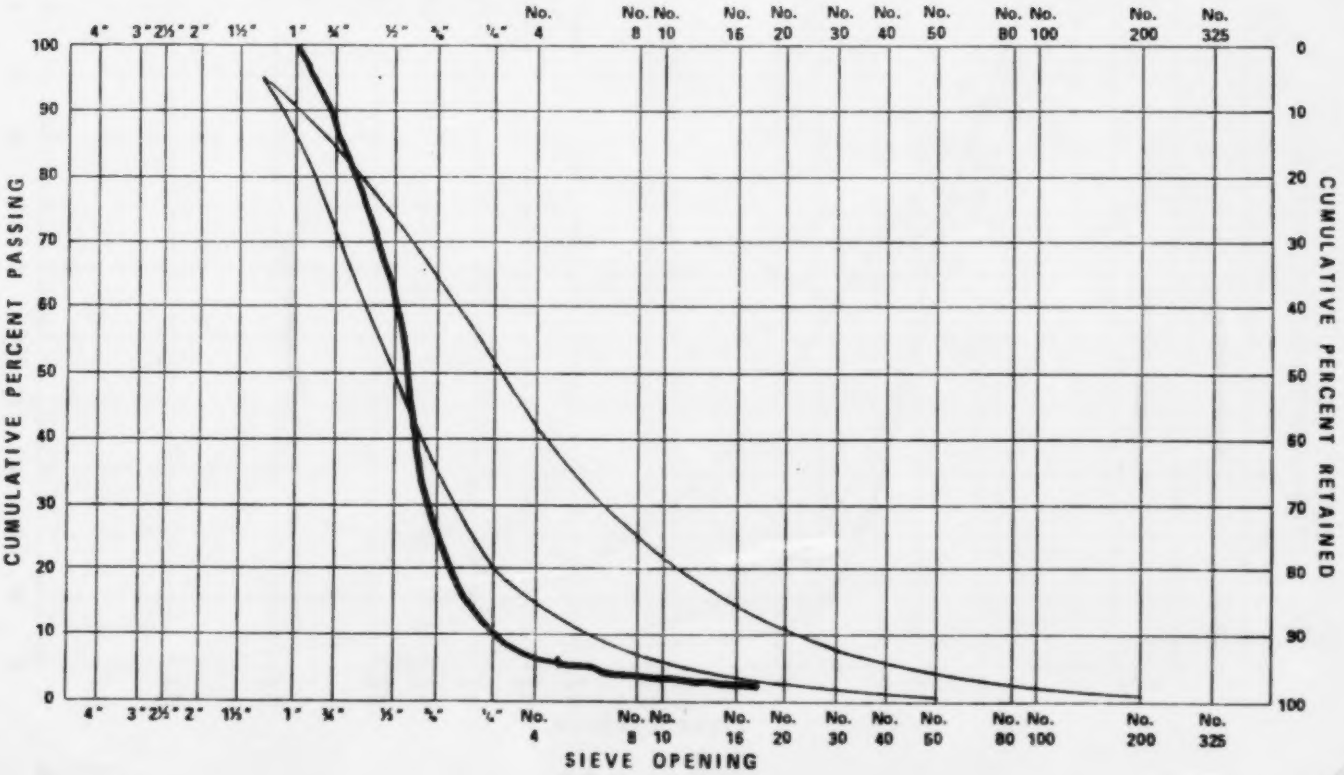
DATE SAMPLE TAKEN 9-7-78

TEST SITE D

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Ohio Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.7	124.0	14.3	0.2	6983.3	100.0	3
1"		1800.7 1375.4	2956.7	42.3	6969.0	99.8	7
1/2"		1753.4 1823.8	3357.8	48.1	4012.3	57.5	3
1/4"		497.5	387.8	5.6	654.5	9.4	3
#8		194.3	84.6	1.2	266.7	3.8	3
#16		291.8	182.1	2.6	182.1	2.6	3



KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 14

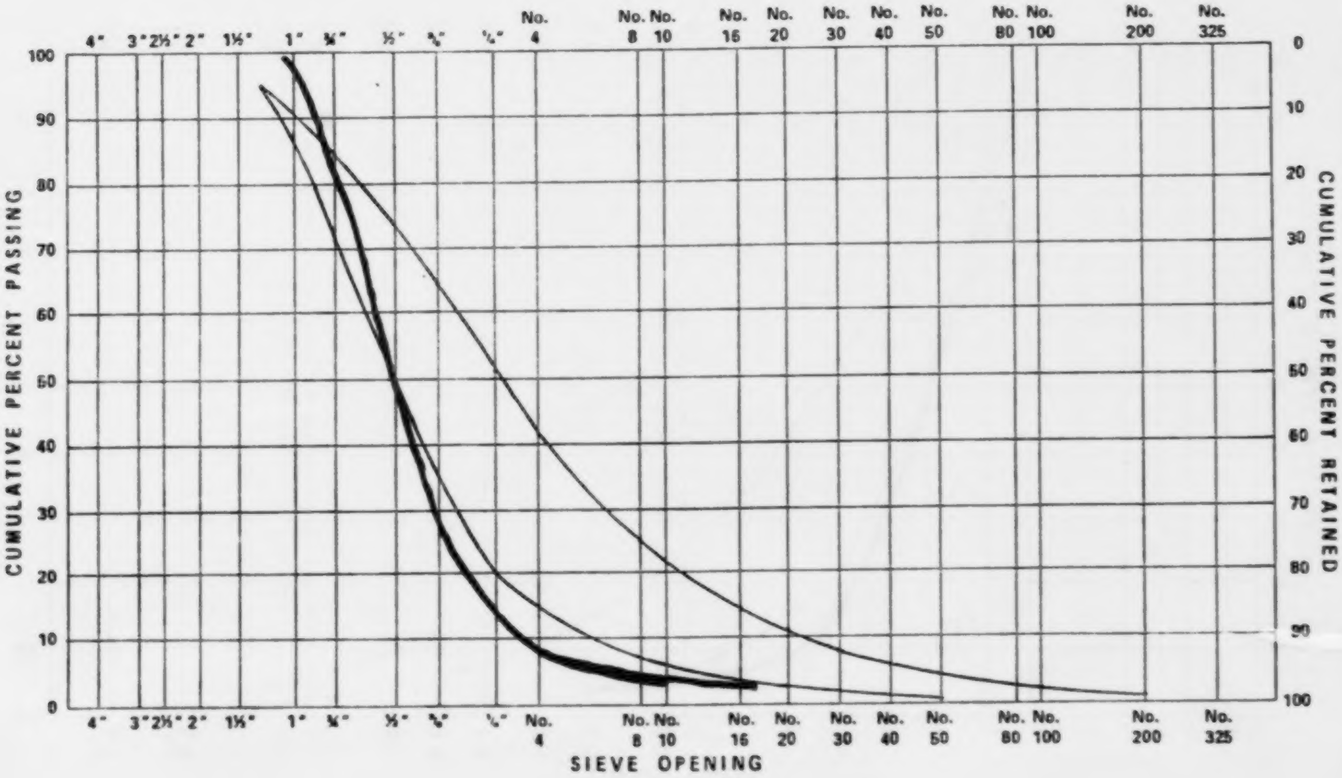
DATE SAMPLE TAKEN 9-11-78

TEST SITE D

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Century Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.6	219.6	110.0	1.5	7399.4	100.0	3
1"	↓	1988.8 1802.9	3572.5	48.3	7289.4	98.5	3
½"		1804.3 1141.7	2726.8	36.9	3716.9	50.2	3
¼"		624.7	515.1	7.0	990.1	13.3	3
#8		242.8	133.2	1.8	475.0	6.3	3
#16		451.4	341.8	4.6	341.8	4.5	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 15

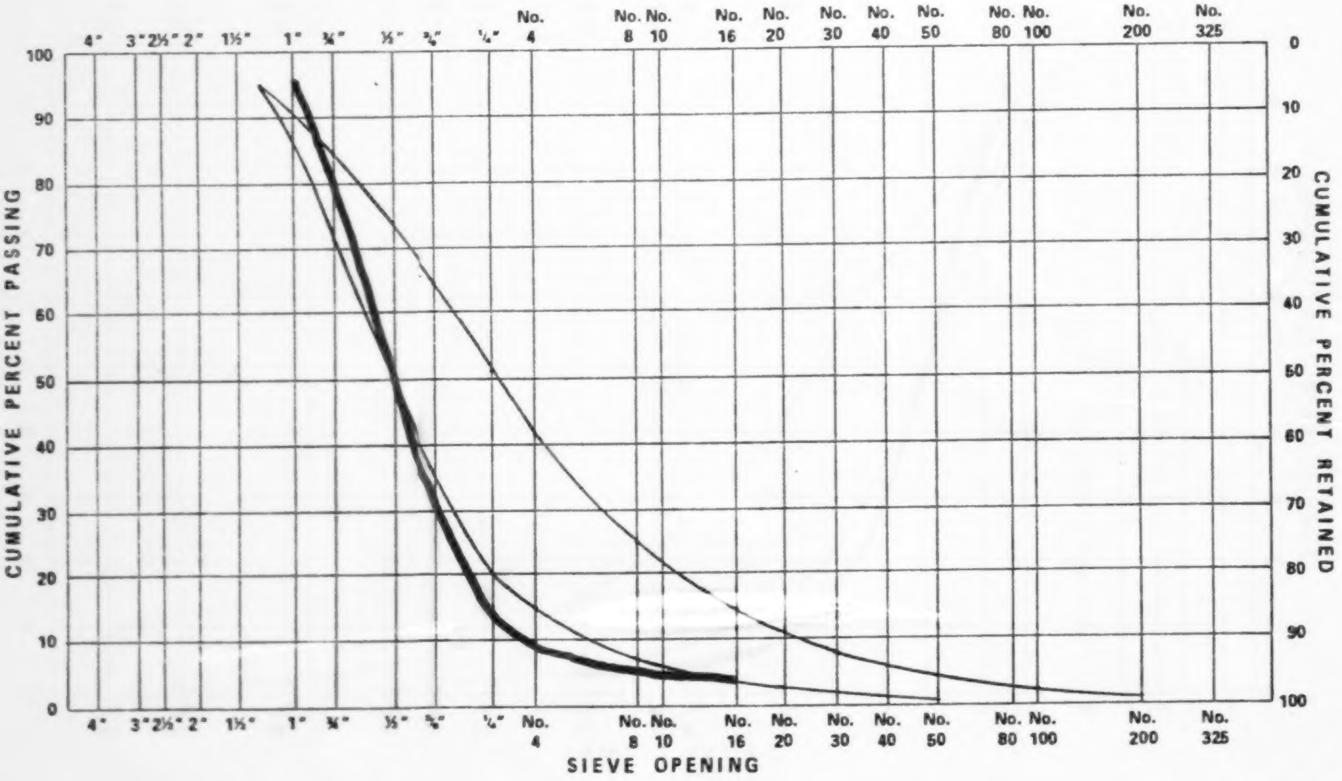
DATE SAMPLE TAKEN 9-12-78

TEST SITE D

TEST PERFORMED BY JOD

SAMPLE IDENTIFICATION Century Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.7	537.2	427.5	5.4	7988.1	100.0	3
1"	↓	1879.3 2048.9	3708.8	46.4	7560.6	94.6	3
1/2"		1804.5 1170.6	2755.7	34.5	3851.8	48.2	3
1/4"		749.1	639.4	8.0	1096.1	13.7	3
#8		236.1	126.4	1.6	456.7	5.7	3
#16	↓	440.0	330.3	4.1	330.3	4.1	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 16

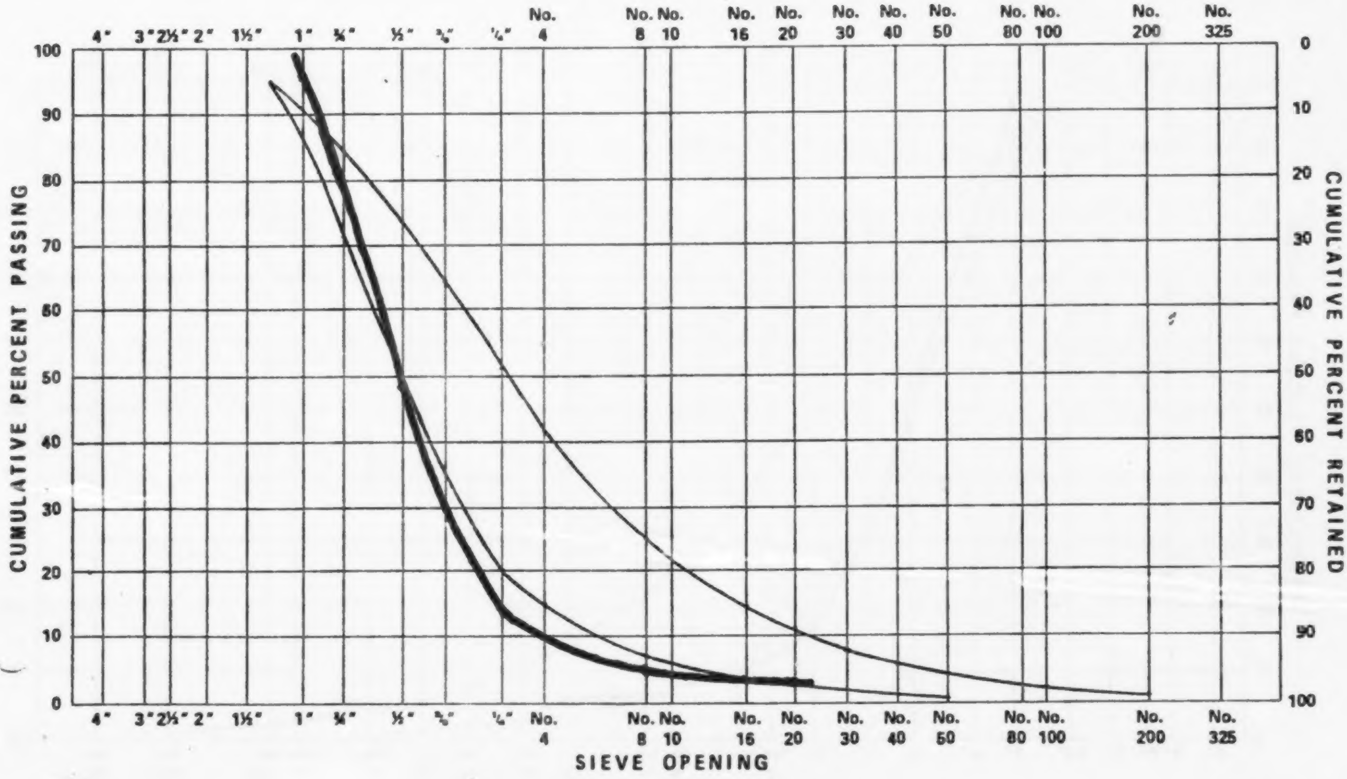
DATE SAMPLE TAKEN 9-13-78

TEST SITE D

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Century Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.6	392.7	283.1	3.9	7243.0	100.0	3
1"		2039.0 1653.2	3473.0	47.9	6959.9	96.1	3
1/2"		1573.5 1104.0	2458.3	33.9	3486.9	48.2	3
1/4"		771.8	662.2	9.1	1028.6	14.3	3
#8		273.0	163.4	2.3	366.4	5.2	3
#16		312.6	203.0	2.8	203.0	2.9	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 17

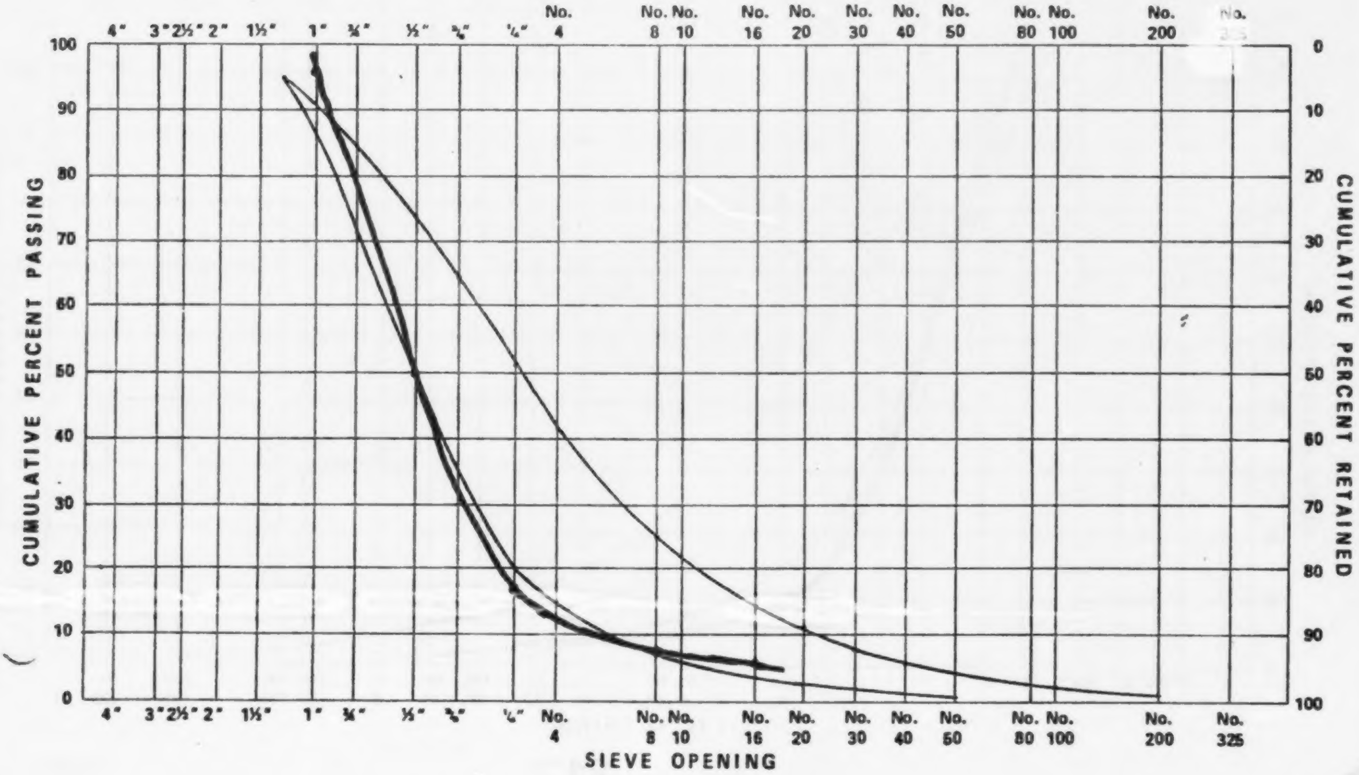
DATE SAMPLE TAKEN 9-14-78

TEST SITE D

TEST PERFORMED BY JRB

SAMPLE IDENTIFICATION Century Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.6	395.4	285.8	4.0	7060.9	100.0	3
1"	↓	2047.6 1442.1	3270.5	46.3	6775.1	96.0	3
1/2"		1683.5 889.4	2353.7	33.3	3504.6	49.7	3
1/4"		771.9	662.3	9.4	1150.9	16.4	3
#8		246.4	136.8	1.9	488.6	7.0	3
#16		461.4	351.8	5.0	351.8	5.1	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 18

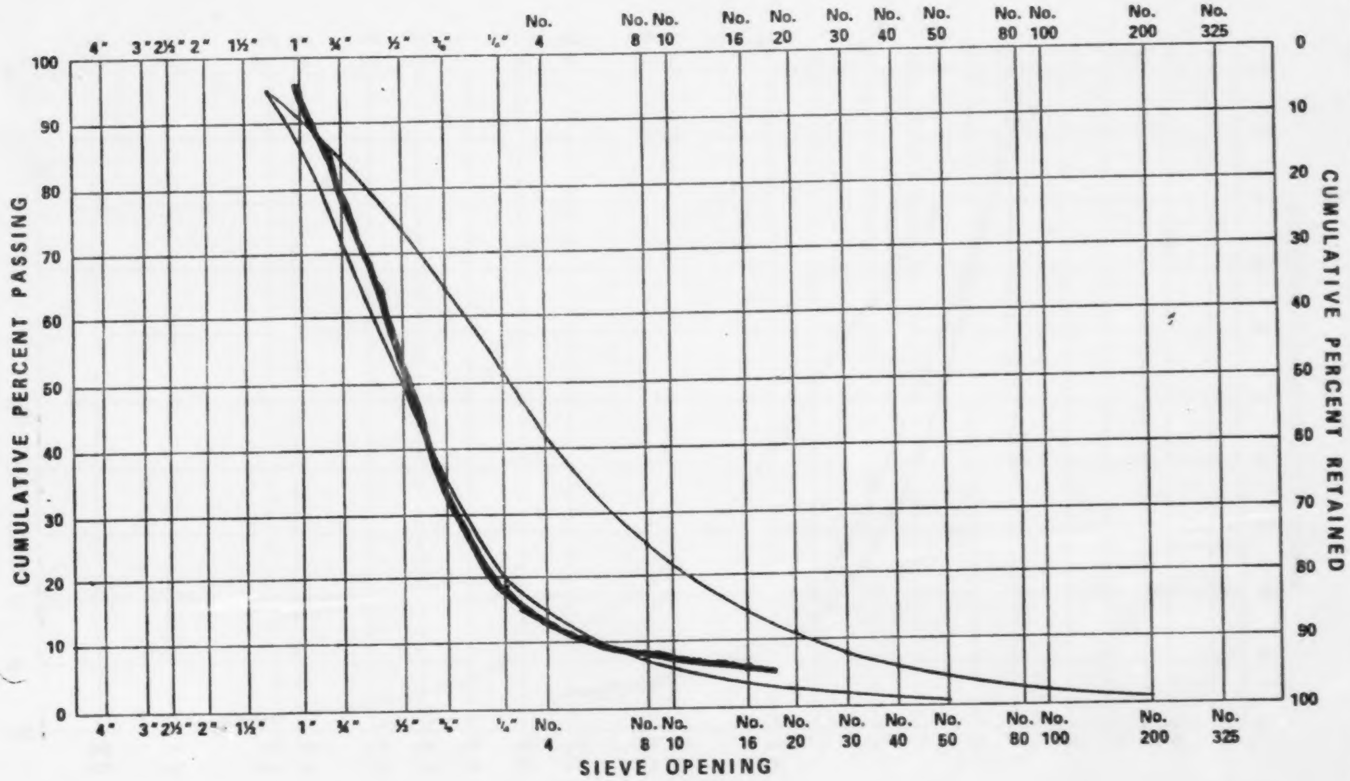
TEST SITE D

SAMPLE IDENTIFICATION Century Coal

DATE SAMPLE TAKEN 9-15-78

TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.5	477.7	368.2	5.0	7356.0	100.0	3
1"		1990.7 1369.9	3141.6	42.7	6987.8	95.0	3
½"		1887.5 845.2	2513.7	34.2	3846.2	52.3	3
¼"		879.1	769.6	10.5	1332.5	18.1	3
#8		274.4	164.9	2.2	562.9	7.6	3
#16		507.5	398.0	5.4	398.0	5.4	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 22

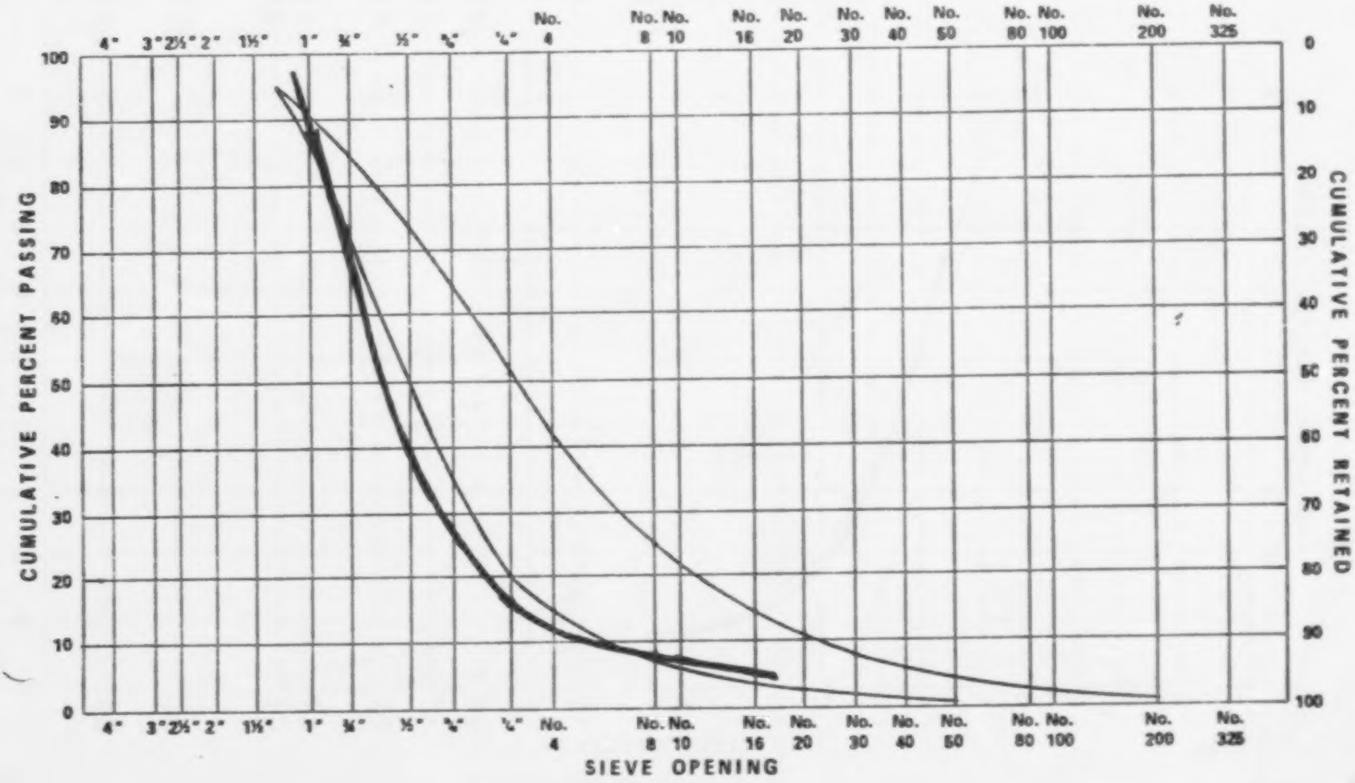
DATE SAMPLE TAKEN 6-21-78

TEST SITE D

TEST PERFORMED BY JoB

SAMPLE IDENTIFICATION Victoria Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.4	1035.1	925.7	11.8	7839.9	100.0	3
1"	↓	1996.2 1491.3 6578	3817.1	48.7	6914.2	88.2	3
½"		1960.6	1851.2	23.6	3097.1	39.5	3
¼"		751.7	642.3	8.2	12459	15.9	3
#8		389.2	279.8	3.6	603.6	7.7	3
#16		433.2	323.8	4.1	323.8	4.1	3



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SIEVE ANALYSIS TEST REPORT

TEST NO. 23

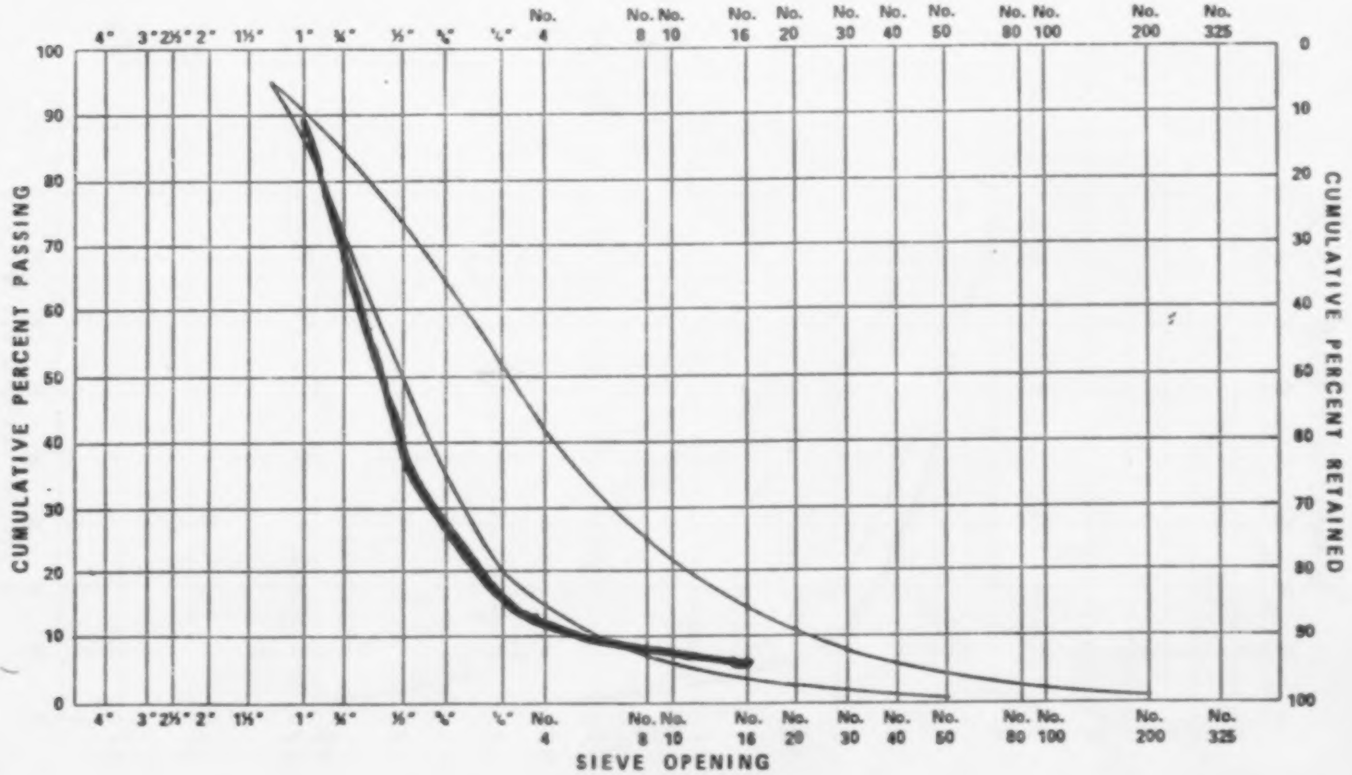
DATE SAMPLE TAKEN 9-22-78

TEST SITE D

TEST PERFORMED BY JB

SAMPLE IDENTIFICATION Victorian

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.6	991.8	882.20	10.6	8301.2	100%	1
1"	↓	1942.6/2297.1	4130.1	49.7	7419.0	89.4	2
1/2"		2100.4	1990.8	24.0	3288.9	39.6	5
1/4"		736.5	626.9	7.6	1298.1	15.6	7
#8		309.1	199.5	2.4	671.2	8.1	11
#16		581.3	471.7	5.7	471.7	5.7	16



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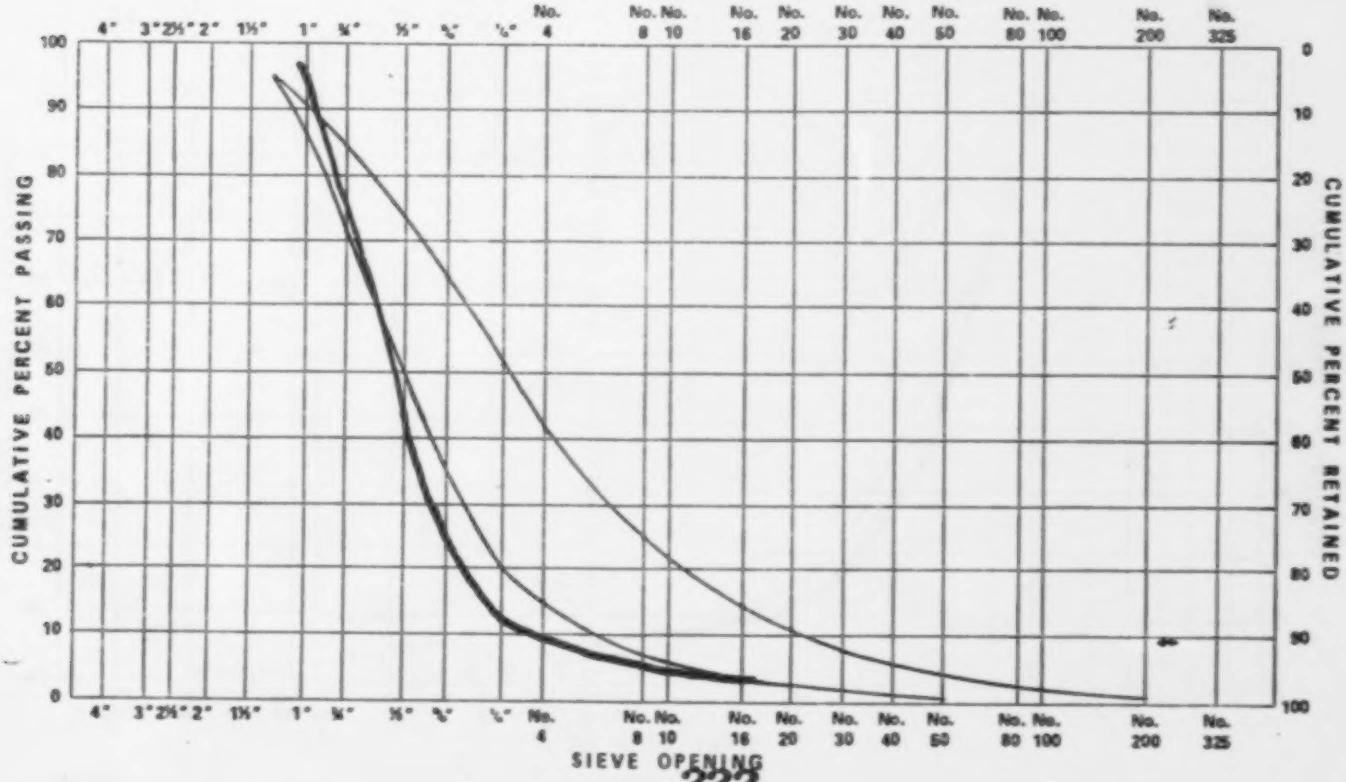
SIEVE ANALYSIS TEST REPORT

TEST NO. Composite
DATE SAMPLE TAKEN 9-18-78
TEST SITE D
TEST PERFORMED BY JOB
SAMPLE IDENTIFICATION Century Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.6	434.0	324.4	5.1	6353.5	100.0	3
1"	↓	1962.9 1475.0	3218.7	50.7	6029.1	94.9	3
½"		1538.0 675.1	2033.9	32.0	2810.4	44.2	3
¼"		576.7	467.1	7.4	776.5	12.2	3
#8		202.2	92.6	1.5	309.4	4.8	3
-#8		326.4	216.8	3.4	216.8	3.3	3



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15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

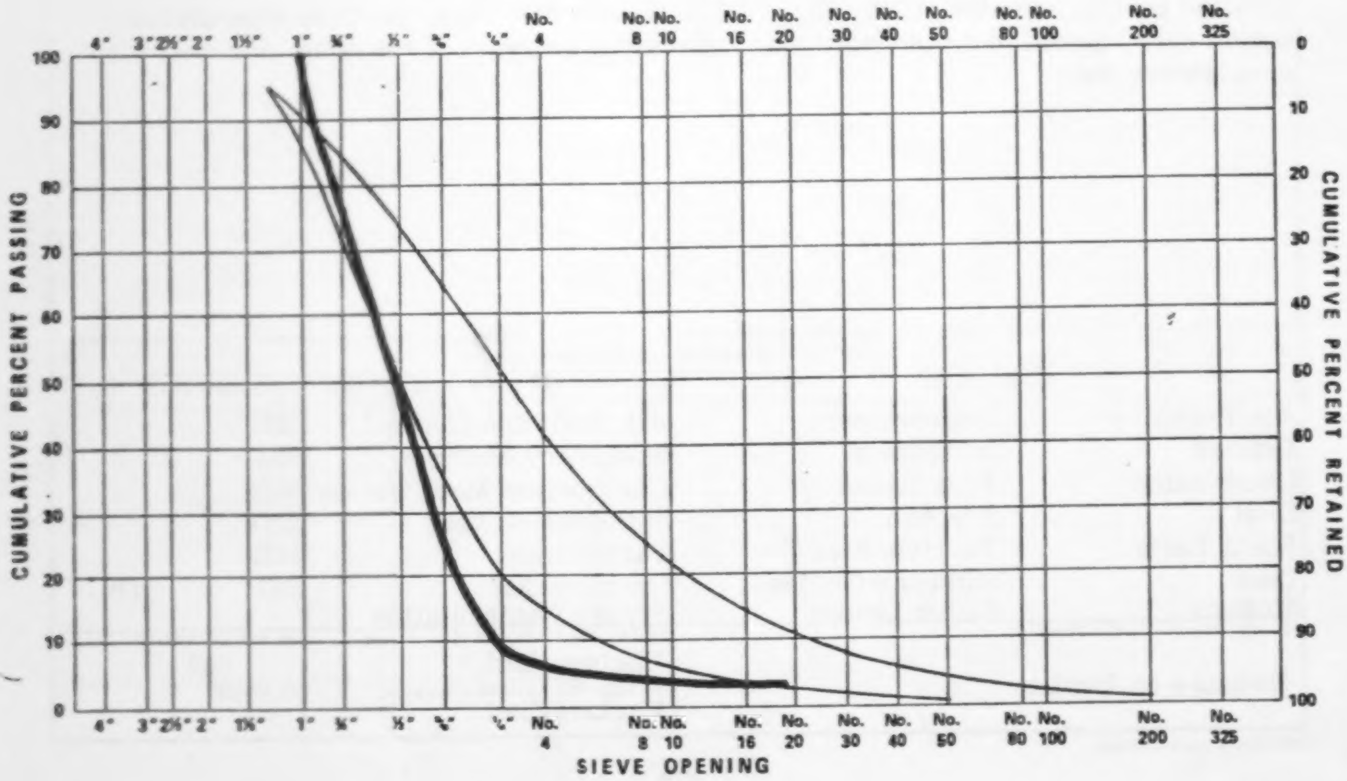
DATE SAMPLE TAKEN 9-19-78

TEST SITE D

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Perfect 8

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.6	158.6	49.0	0.7	7332.3	100.0	3
1"	↓	1818.0 1283.8 1065.2	3836.2	52.3	7283.3	99.3	3
1/2"		1751.7 1287.3	2819.8	38.5	3447.1	47.0	3
1/4"		419.2	309.6	4.2	627.3	8.5	3
#8		193.0	83.4	1.1	317.7	4.3	3
#16		343.9	234.3	3.2	234.3	3.2	3


CUMULATIVE PERCENT PASSING
100
90
80
70
60
50
40
30
20
10
0
CUMULATIVE PERCENT RETAINED
4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
SIEVE OPENING